

**SWINGING THE SLEDGEHAMMER: THE COMBAT EFFECTIVENESS OF
GERMAN HEAVY TANK BATTALIONS IN WORLD WAR II**

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ABSTRACT

SWINGING THE SLEDGEHAMMER: THE COMBAT EFFECTIVENESS OF GERMAN HEAVY TANK BATTALIONS DURING WORLD WAR II by Major Christopher W. Wilbeck.

This thesis is a historical analysis of the combat effectiveness of the German *schwere Panzer-Abteilung* or Heavy Tank Battalions during World War II. During the course of World War II, the German Army developed heavy tank battalions to fulfill the concept of breaking through enemy defenses so faster, lighter mechanized forces could exploit the rupture. These heavy tank battalions had several different tables of organization, but were always centered around either the Tiger or the Tiger II tank. They fought in virtually every theater of Europe against every enemy of Germany. Ultimately, the German military created eleven Army and three Waffen-SS heavy tank battalions. Of the Army battalions, the German command fielded ten as independent battalions, which were allocated to Army Groups as needed. The German Army assigned the last heavy tank battalion as an organic unit of the elite Panzer Grenadier Division *Grossdeutschland*. The Waffen-SS allocated all of their battalions to a different Waffen-SS Corps.

Because these units were not fielded until late in 1942, they did not participate in Germany's major offensive operations that dominated the early part of World War II. Germany's strategic situation after mid-1943 forced their military onto the defensive. Consequently, there are very few instances when heavy tank battalions attacked as a breakthrough force. During the latter part of the war, they were used in many different ways to provide defensive assistance along very wide frontages. This study assesses the German heavy tank battalions as generally effective, primarily because of the high kill ratio they achieved. However, based upon observations from a wide variety of examples, this study also outlines several areas where changes may have increased their effectiveness.

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CHAPTER 1

INTRODUCTION

The only instrument of armored warfare which German commanders regarded as qualitatively different from the rest was the Mark VI Tiger, which was not allotted to divisions but organized in independent battalions, kept under central control, and committed to crucial offensive and counter-offensive missions.¹

John Keegan, *The Second World War*

The German Tiger and Tiger II tanks were legends in their own time. They were arguably the most feared weapon developed by the Germans. The men who commanded these tanks accomplished extraordinary feats. This thesis analyzes the combat effectiveness of the German *schwere Panzer-Abteilung* (*s.Pz-Abt.*), or heavy tank battalions. This thesis shows that although they were rarely used in the role for which they were originally conceived, that of breaking through prepared enemy defenses, these units were effective in the offense and defense in destroying enemy tanks. However, results varied between different battalions and leaders could have increased the heavy tank battalion's effectiveness with better doctrine and employment. The analysis includes the performance of doctrinal and assigned missions from both the Western and Eastern Fronts, and it considers doctrine, force structure, equipment, leadership, and personnel.

Although there is a great wealth of information available on many aspects of the heavy tank battalions, no literature exists to answer whether these units were viable forces that achieved the doctrinal mission for which they were conceived. Also, no scholar has looked into whether they were able to accomplish the missions assigned to them while the German Army was on the defensive; counterattacking, reinforcing other

units in the defense, or as a mobile reserve. This thesis fills that void by studying unit histories and engagements from all perspectives while looking at the different organizations developed, types of equipment, and missions of the heavy tank battalions.

Background

After World War I, the armies of the world wrestled with the lessons learned during that war. They tried to come up with solutions for overcoming the linear, stalemated war of World War I. The objective was to go beyond positional, attrition warfare and return to a war of maneuver. In order to do this, a breakthrough of the enemy's defenses had to be attained. Many military theorists tried to conceive a doctrine to rupture and exploit the enemy defensive line. Great Britain, Germany, and Russia all published material in their professional military journals that put forth the idea of attacking in waves of tanks. In these theories, the lead wave consisted of the "heavy" tanks and the follow-on waves were lighter, faster tanks that exploited the breach. Although the German Army planned for heavy tanks and development of the *Durchbruchswagen* (breakthrough tank) began in 1937, no heavy tanks were fielded before World War II began.²

The German Army ultimately developed their own concept of mobile warfare that was very successful during the first part of World War II in encircling enemy forces. Their success in Poland, France, and during the first year in Russia precluded the necessity of having to "break-through" a continuous line of fortified defensive positions; thus they did not suffer from the lack of heavy tanks in their armored forces. However, the German Army's encounter with the Soviet T-34 Medium and the KV-1 heavy tanks

during their advances near the end of 1941 reinvigorated the development of their dormant heavy tank program.

The German Army created the first two heavy tank companies on 16 February 1942 and assigned them to the first heavy tank battalion that was created on 10 May 1942.³ These heavy tank battalions were not assigned to the organization of Panzer Divisions, rather, they were used as *Heeres-Truppen* (army level units). The Army High Command (OKH) allocated these units to army groups who would be free to subordinate them further to armies, corps, or even to divisions for employment. Before the war was over, the army fielded eleven and the *Waffen-Schutzstaffel* or (armed SS) fielded three heavy tank battalions.

These organizations had several different Tables of Organization but were always centered around either the Tiger or the Tiger II (also known as the King Tiger or Royal Tiger) tank.⁴ They were in continual service from 16 September 1942, when they saw their first action against the Russians near Leningrad, until the end of the war.⁵ During this time, they fought in virtually every region of the European theater against Russians, Americans, and British forces.

Historical Literature

There are many books available that discuss the primary piece of equipment of the heavy tank battalions, the Tiger and Tiger II tanks. There is also a vast amount of literature about the individuals who attained incredibly high kill totals while commanding these tanks. Very little, however, is written about the actual units in which these tanks and individuals operated. The biggest shortcoming is works on the effectiveness of the heavy tank battalions. At best, there are several books covering the combat histories of

heavy tank battalions using combat reports of these units. These books do not attempt to analyze any of these combat actions and do not include conclusions on their role in combat.

Although there are weaknesses in the literature of heavy tank battalions, there are some works that provide useful insights. Two of these accounts are from Heinz Guderian. Guderian played a very important role in the development of armored doctrine before World War II as a leading theorist and as the *Chef der Schnellen Truppen* (Chief of fast troops) and during the latter half of the war as *Generalinspekteur der Panzertruppen* (Inspector General of armored forces). Any exploration of Germany's doctrinal development and use of armored forces is deficient without including Heinz Guderian's two books. His first book, *Actung-Panzer! The Development of Armoured Forces, their Tactics and Operational Potential* provides a background on doctrine prior to World War II. His second book, *Panzer Leader*, was written after the war and provides information concerning changes in the doctrine and employment during World War II. Because *Achtung-Panzer!* was written prior to the development and fielding of any heavy tank battalions, it contains no specific analysis of these units, but it does provide the foundation for defining the doctrinal role envisioned for heavy tank battalions. *Panzer Leader* contains several reflections on the correct employment of heavy tank battalions, but its insights focus on the initial fielding of the heavy tank battalions prior to the battle of Kursk.

In terms of combat histories of the heavy tank battalions, Wolfgang Schneider's *Tigers in Combat I* and *Tigers in Combat II* are good sources of information obtained from personal interviews, unit histories, and battle reports. The first book covers the ten

army heavy tank battalions and the second book covers the Waffen-SS battalions and the heavy tank battalion of Panzer Grenadier Division *Grossdeutschland*, as well as other units that included a heavy tank company. These books provide a brief overview of each unit that includes equipment, organization, camouflage and markings. The primary source of combat history comes in the form of a sentence or paragraph of what the unit's actions were on a particular date, similar to a daily logbook or diary. The type and amount of information given varies from unit to unit and from time period to time period. Although providing a great deal of information, Schneider's books do not include an analysis of heavy tank battalion combat actions. The daily log entries, however, do contain information on the changes in the battalion's combat power and the operational status of its Tigers. His books provide a table for each unit, detailing the date and cause of each Tiger lost. It also contains information on the number of enemy tanks and equipment destroyed during stated time periods so that an evaluation of tank kills and losses can be ascertained through the unit's log.

Two unit specific heavy tank battalion combat histories in English provide combat details, but little analysis. They are *The Combat History of schwere Panzer-Abteilung 503* and *The Combat History of schwere Panzer-Abteilung 508*, and they recount the respective unit histories from the officers and soldiers that served in these units. Included in these are personal accounts of these units in combat. Together these units were involved in important battles at Kursk, Normandy, Italy, and in the attempt to relieve the encircled German forces in Cherkassy. These books provide in-depth, personal accounts of heavy tank battalions in combat. As a compilation of logs, diaries, and personal accounts, these books are very valuable sources to gain insight into the

combat actions of the heavy tank battalions but they do not attempt to analyze the effectiveness of the units. Some of the diary entries are from the battalion and company commanders and include losses and enemy destroyed on a daily basis along with a narrative account of the action. These expand and clarify the simple entries in Schneider's *Tigers in Combat I* and *Tigers in Combat II* and provide personal insight into the units' actions during combat.

Many books discussing the technical aspects of the Tiger and Tiger II are available. The single most important author on Tiger tanks in general is Thomas L. Jentz. His books *Germany's Tiger Tanks, D.W. to Tiger I* and *Germany's Tiger Tanks, VK45.02 to Tiger II* provide a great deal of information from primary sources on the design, production, and modifications of the Tiger and Tiger II. In all of Jentz's works, his standard for inclusion in one of his books is that it must be obtained from original records from World War II.

Jentz has also written a two volume work on armored forces titled *Panzertruppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force*. This book is valuable because it draws on many other sources and participants in the development of the heavy tank battalions. It is especially helpful in tying together the doctrinal changes in the German army with the technical development of the heavy tank and the Tiger program. This book contains heavy tank battalion combat reports that provide recommendations to improve the doctrine, organization, or equipment associated with these units.

By far, the single most valuable work on this subject is yet another book by Jentz. His book, *Germany's Tiger Tanks, Tiger I & II: Combat Tactics*, concentrates on the

tactical application of Tigers and uses original accounts in the form of after action reports. As he states in his introduction, “these original after action reports are very valuable in obtaining a true picture of applied tactics. As written, they would have had to meet the tough test of peer acceptance.”⁶ Because they were written shortly after the events occurred, they also have the advantage of being recorded before memories became clouded by time. Most of the German reports appear to have been written with the motive of initiating improvements to the Tigers or changing tactics. As useful as this book is in researching the heavy tank battalions, it still only provides a limited foundation to evaluate the unit’s performance and does not attempt to analyze combat effectiveness in a comprehensive manner. Finally, as the title of the book suggests, the primary focus is on the employment of units below battalion level, although there is some good information on battalion tactics.

Looking at the heavy tanks from the opponent’s view, David Fletcher’s *Tiger! The Tiger Tank: A British View* provides excellent insight into the British perspective of the Tiger tank as a technical piece of equipment. However, it offers little detail into thoughts of British commander’s during World War II regarding the heavy tank battalions, their doctrine and effectiveness.

Overcoming Biases

A thorough study of various battles and engagements from Allied unit histories and published historical accounts reveals strong biases within the Allied forces. Among the Allied armies, units continually reported that Tiger tanks were in their sector or that they had destroyed Tiger tanks. For example, a casual reading of Allied accounts during the battle of the Bulge would indicate that at least half of the German tanks employed

there were Tigers. Actually, no more than 136 Tigers were involved, with the vast majority of German tanks in the battle being Panther and Panzer IVs.⁷ The Soviets also have to be treated with the same skepticism in some instances. For example, Soviet propaganda claimed that 700 Tigers were destroyed during the battle of Kursk. This number is five times more than the actual number engaged in the fighting.⁸

In order to obtain the most accurate picture possible, this thesis uses many different sources. Tank kills reported by the heavy tank battalions against the British and US were verified in specific engagements from a variety of records, including unit histories, after action reports, diaries and other personal accounts. Soviet tank losses were often omitted in their unit histories and in personal accounts, making an accurate count much more difficult to obtain. Several western sources provide some analysis of Soviet tank losses in several battles and were used to confirm German claims.

A source of confusion in reporting tank losses and kills is the definition of what constitutes destruction of a tank. Tanks of World War II, especially the Tiger, were robust and resilient and could be repaired and put back into action if they were recovered and brought back to a maintenance unit. One side may have claimed the destruction of an enemy tank, but in reality, that tank was repaired and returned to service.

The German heavy tank battalions submitted regular reports on Tigers destroyed and also on the number operational. An unserviceable tank required the unit to make a report, giving the chassis number, a survey of the damage and an estimate of the time needed for the repairs.⁹ A second report was made at a higher level, indicating the number of tanks in working order for the unit, and the number of tanks under repair.¹⁰ In all cases, clarity and accuracy were required. This makes obtaining an accurate

accounting of the number of German tanks destroyed easier with one notable exception. The records for the Tiger II equipped units, especially those fighting the Russians, are incomplete because the unit war diaries and other unit records were either destroyed or captured by the Soviets.¹¹

Measures of Effectiveness and Organization of Thesis

This thesis is organized into five chapters. This first chapter outlines the thesis problem and provides an overall background. The second chapter outlines the development of heavy tank battalions. This overview incorporates doctrine, organization, equipment, personnel, and tactics in order to understand its doctrinal role and mission.

Chapters three and four are historical examples and analysis of heavy tank battalions in combat. These chapters are the primary chapters in analyzing and measuring the effectiveness of the heavy tank battalions. Chapter three examines the heavy tank battalions from their creation and initial combat actions in 1942 until the end of the Battle of Kursk. Chapter four continues from the Battle of Kursk to the end of World War II. The Battle of Kursk in July 1943 marked a transitional period in the development and organizational make-up of the heavy tank battalions and was a period where the German Army moved from offensive to defensive operations.

German doctrine placed great emphasis upon the heavy tanks' destruction of opposing tanks in both the offense and the defense. Because of this emphasis, the heavy tank battalions' effectiveness is partly measured throughout this thesis as the tank kill/loss ratio. Because circumstances may have precluded a tank to tank battle, a simple ratio of kills to losses, does not completely assess effectiveness. Therefore, a secondary measure of effectiveness used in this thesis is that of mission accomplishment, or in other

words, whether the battalions accomplished their assigned missions. Where possible, direct accounts from veterans or after-action reports are used to determine the unit mission. In many instances there is no written historical record, thus making it extremely difficult or impossible to know exactly the mission of an individual battalion. Using the larger operational and tactical environment and opposing forces, logical deductions are made about the probable unit mission.

¹John Keegan, *The Second World War* (New York: Penguin Books Ltd., 1990), 402.

²Thomas L. Jentz and Hilary L. Doyle, *Germany's Tiger Tanks, D.W. to Tiger I: Design, Production & Modifications* (Atglen, Pennsylvania: Schiffer Publishing, Ltd., 2000), 10.

³Thomas L. Jentz, *Panzertruppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942* (Atglen, Pennsylvania: Schiffer Publishing, Ltd., 1996), 220.

⁴Both the Tiger and Tiger II's numerical classification was Panzerkampfwagen VI or Panzer VI.

⁵Thomas L. Jentz, *Germany's Tiger Tanks, Tiger I & II: Combat Tactics* (Atglen, Pennsylvania: Schiffer Publishing, Ltd., 1997), 38.

⁶Ibid., 7.

⁷Danny S. Parker, "German Tiger Tanks were at the Battle of the Bulge, but not in the numbers usually cited for them," *World War II*, March 1990, 8.

⁸Jean Restayn, *Tiger I on the Eastern Front*, trans. Alan McKay (Paris: Histoire and Collections, 1999), 101.

⁹Jean Restayn, *Tiger I on the Western Front* (Paris: Histoire and Collections, 2001), 4.

¹⁰Ibid.

¹¹Peter Gudgin, *The Tiger Tanks* (London: Arms and Armour Press, 1991) 133.

CHAPTER 2

HEAVY TANK BATTALION OVERVIEW

It is vital to establish the basic purpose of the tank forces. Are they intended to storm fortresses and permanent defensive positions, or to carry out operational envelopments and turning movements in the open field; to act at the tactical level, making breakthroughs on our own account and checking enemy breakthroughs¹ and envelopments; or will they be no more than armored machinegun carriers.¹

Heinz Guderian, *Achtung-Panzer!* 1937

After World War I, all armies struggled with the problem of how a future war would be waged and to avoid a repeat of static, attrition warfare. Heinz Guderian was one theorist who attempted to solve this problem. He is widely viewed as the principle architect of Germany's armored forces and primary source of doctrinal development of their use.² His writings greatly influenced the German army and his vision of armored warfare allowed Germany to enjoy great success during the initial years of World War II.

Doctrine

Prior to Guderian publishing his ideas on armored warfare, other theorists from England, France and the Soviet Union developed their own ideas about the future of warfare. Guderian admits that the books and articles of J. F. C. Fuller and Basil Liddell Hart interested him and gave him food for thought.³ Marshal Mikhail Tukhachevsky from the Soviet Union also read Fuller's and Hart's work and formed large mechanized units in the Red Army.⁴ German theorists borrowed Tukhachevsky's ideas and his ideas are evident in the evolution of German military thought on the use of armored forces.

In Germany, military leaders and theorists debated the use of armored forces, and armored doctrine continually evolved prior to World War II. In 1929, one German author

published an article in the *Militär-Wochenblatt* (Military Weekly) that concluded that the tank had three different missions. The first was as an infantry battering ram during a tactical breakthrough. Next, they were required to suppress the enemy's artillery, and finally they were to penetrate deeply to block approaches, and to complete a strategic breakthrough.⁵

The German Army Chief of Staff, Ludwig Beck, published a modernization plan in 1935 that outlined two different requirements for tanks; frontally assaulting an evenly matched opponent and exploiting beyond the front line to deep objectives.⁶ Guderian realized that tanks or infantry alone could not overcome the enemy defensive zone and published an article in 1936 that focused on the combination of infantry, artillery, air support, and armor in offensive operations.⁷

A similar idea of all of the theorists was the use of tanks in waves to first overcome the enemy defensive line, then engage the enemy artillery and defeat enemy counterattacks, and finally to exploit the penetration by seizing deep objectives. The terms used and the number of waves of tanks varied with the different authors, but the ideas for overcoming the enemy defensive zone remained similar. A constant theme was that tanks must be concentrated and that each wave must have a special, well-defined mission. The tasks associated with the first wave necessitated attacking under fire from artillery and antitank guns, as well as being able to defeat enemy armored counterattacks. Heavy tanks were to comprise the first wave and follow on waves consisted of medium and light tanks.

In 1937, Guderian published *Achtung-Panzer!* This book was widely read in the German army and set forth their doctrine of mobile and armored warfare. In it, Guderian

established the principle, applicable to all tanks regardless of size or mission, of concentration. This principle stated that tank forces must be concentrated and “deployed en masse in both breadth and depth.”⁸ He stated that “concentration of the available armored forces will always be more effective than dispersing them, irrespective of whether we are talking about a defensive or an offensive posture, a breakthrough or an envelopment, a pursuit or a counterattack.”⁹

When discussing heavy tanks, Guderian was prophetic in writing that “there will never be many heavy tanks, and they will be used either independently or within the structure of the tank forces, according to the mission. They represent an extremely dangerous threat and are not to be underestimated.”¹⁰

Guderian included a whole chapter in his book illustrating how he envisioned conducting a breakthrough of an enemy position with armored forces. He emphasized the incorporation of all arms throughout the breakthrough. Of primary importance in assisting the heavy tanks were the engineers because they needed to locate and clear mines and other obstacles so that the tanks were not disabled. The first adversary that the heavy tanks must defeat was the antitank guns in the defensive line. Guderian wrote that they could be defeated by direct fire, suppressed with artillery or machine gun fire, or blinded by smoke.¹¹

The next goal of the heavy tank forces was the enemy’s artillery but Guderian theorized that the penetration of the infantry and antitank gun defense would force the enemy to commit his own tanks.¹² In stressing the importance of the tank battle, Guderian wrote:

The tank's most dangerous enemy is another tank. If we are unable to defeat the enemy armor the breakthrough has as good as failed, for our infantry and artillery will be unable to make further progress. Everything comes down to delaying the intervention of the enemy antitank reserves and tanks, and getting in fast and deep into the zone of the hostile command centers and reserves with our own effective tank forces -- and by "effective" we mean forces that are capable of waging a tank battle.¹³

The lead tanks that were tasked to complete this tactical breakthrough had to overcome a great deal of resistance and Guderian theorized that the main weapon on the ground for this mission was the heavy tank. He stressed that the most important piece of the entire breakthrough battle was that of defeating the tank reserves.¹⁴ Guderian wrote that: "If we fail to beat down the enemy tank defenses and defeat the enemy tanks, the breakthrough has failed, even if we manage to wreak some destruction in the infantry battle zone."¹⁵

During the war, the German concepts behind this doctrine did not change drastically. Albert Kesselring and Max Simon wrote in 1952 that tanks attacked in several waves, with the distance between waves dependant upon the terrain and enemy fire.¹⁶ They stated:

The heavy tanks form the core of the spearhead and their main objective is the enemy tanks and antitank guns which can be eliminated early by using the greater range and larger caliber gun of the heavy tanks. The mission of the first wave is to penetrate into the enemy lines as deeply as possible while the second wave enlarges the penetration, never losing sight of the first wave in order to provide fire protection to that wave.¹⁷

In clearly defining the importance of penetrating to engage and defeat the enemy armor, they stated, "It is not the mission of the tanks to entirely eliminate enemy pockets of resistance. That is the mission of the armored infantry."¹⁸

German doctrine during this period focused almost exclusively on the offensive. The defensive implications evident from the examples of the breakthrough battle are that armor formations in the defense are to be held back to defeat any penetrations by enemy armored formations.

Albert Kesselring and Max Simon also wrote one paragraph in their manual on the employment of armored forces in the defense. They stated that armored units “are used for defensive purposes only in exceptional cases.”¹⁹ Their mission consisted of being at the disposal of the mobile reserve of the higher command level to smash enemy breakthroughs. These counterattacks were governed by the general attack principles. They added that crews and vehicles must always be ready for action, that all counterattack routes must be reconnoitered, marked and maintained, and that the armored forces must be fully aware of the situation at the front.²⁰

Organization

In a memo dated 24 November 1938, the Commander in Chief of the Army, General von Brauchitsch, presented guidelines establishing a heavy tank company and assigning one to each panzer brigade.²¹ Inexplicably, in February 1939 when the German Army General Staff outlined its plans for reorganization from light panzer divisions and panzer brigades to panzer divisions, it eliminated the heavy tank company authorization from the new panzer regiment organization.²² In a special reorganization, the Army General Staff added a medium tank company to the panzer regiment organization in September 1939.²³ It was this panzer regiment and division organization that fought and won in Poland, France and during the early stages in Russia.

Lacking a true heavy tank, the Germans used the Panzer IV with a low-velocity seventy-five-millimeter main gun to fulfill the heavy tank role within these medium tank companies through Poland, France, and when Germany invaded Russia in June 1941.²⁴ Until the German armored forces encountered the Russian heavy tanks, like the KV I, KV II, and the T-34/76, the Panzer IV was sufficient in construction, armor and armament to meet the demands of a heavy tank.²⁵ The appearance of the T-34-76 specifically, greatly influenced and decisively accelerated German heavy tank construction. The German Army needed a heavy tank with more armor and a larger main gun capable of penetrating the sloped armor of the T-34.

While the Army Ordnance Department was developing the heavy tank, the Army General Staff made plans to field heavy tank companies when production began. Initially, the plan for the heavy tank company included three platoons, each with three Tigers for a company total of nine heavy tanks.²⁶ Until the spring of 1942, this plan included the heavy tank companies in the current panzer regiment organization within panzer divisions, although a formal change to the organization was not made.

After the automotive design office of the Army Ordnance Department finalized the Tiger and estimated production figures, the Army General Staff realized that the Tiger could never be produced in sufficient quantity to replace the Panzer IV on a one for one basis. The new tank also lacked the tactical mobility to be included in the panzer divisions.²⁷ It was difficult to find a suitable place for the Tiger in the panzer divisions, and as a scarce resource, the Army General Staff decided to consolidate the available Tigers in independent heavy tank battalions and employ them where they were needed

most.²⁸ They thought that in so doing, they could be most economically employed directly under the command of an army or corps headquarters.²⁹

On 16 February 1942, the Army General Staff created the first two heavy tank companies and subsequently assigned them to the first heavy tank battalion, the 501st Heavy Tank Battalion. Hereafter, this paper will refer to these units by their German abbreviation, for example s.Pz.-Abt. 501 is used for this unit. The first three heavy tank battalions, the s.Pz.-Abt. 501, 502, and 503, were created in May 1942.³⁰

These units organized themselves based upon the current wartime organizational table, hereafter referred to by the German abbreviation of K.St.N. This K.St.N. called for nine heavy tanks in a company consisting of three platoons with three tanks each. The heavy tank battalions received new guidance via a general army bulletin on 21 August 1942 to organize on a new set of K.St.N.s. The new heavy tank companies organized themselves in accordance with K.St.N. 1176d, dated 15 August 1942.³¹ This company organization was known as heavy tank company d, and is referred to throughout this thesis as the D company organization (see figure 1). The primary difference between this organization and previous heavy tank companies was that this organization authorized a mix of heavy and light tanks, with Tigers and Panzer IIIs integrated within each platoon of the company.

This version of the heavy tank company lasted until the General Staff published a new K.St.N. in May 1943. By that time, the German Army had equipped and fielded five heavy tank battalions, with s.Pz.-Abt. 504 and 505 being created in December 1942 and January 1943 respectively.³²

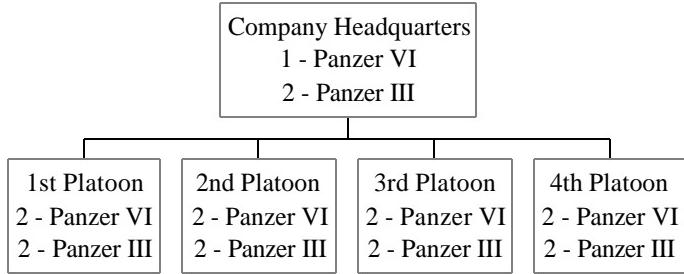


Fig. 1. Heavy Tank Company, K.St.N. 1176d Dated 15 December 1942.
 Source: Jentz, *Tiger I & II: Combat Tactics*, 25-26.

These battalions experimented and used almost every variation of the D company organization. Some companies changed their organization internally to form two light and two heavy platoons.³³ Some companies organized their platoons so that there was a light and heavy section, while some had their sections within platoons integrated with a Panzer III and a Tiger.³⁴

These internal reorganizations focused on finding the best combination and organization to accomplish the mission. All echelons of command gave great leeway and latitude to experiment in an attempt to find a combination of vehicles that worked best. Some companies within the same battalion and some platoons within the same company were organized differently.

The purpose of mixing platoons and sections with Panzer IIIs and Tigers was for the light tanks to provide the heavy tanks with close support against infantry and assist in destroying antitank guns threatening the Tigers.³⁵ The K.St.N. did not specify which model of Panzer III was authorized for the heavy tank companies.

The heavy tank battalion was authorized three heavy tank companies but due to a shortage of Tigers, no battalion ever fielded a third company of the D Company

organization. A headquarters company and a maintenance company, along with the two heavy tank companies, completed the total organizational structure of the heavy tank battalion. The headquarters company was organized in accordance with K.St.N. 1150d, dated 15 August 1942, thus keeping the D designation to the overall heavy tank battalion organization (see figure 2).³⁶

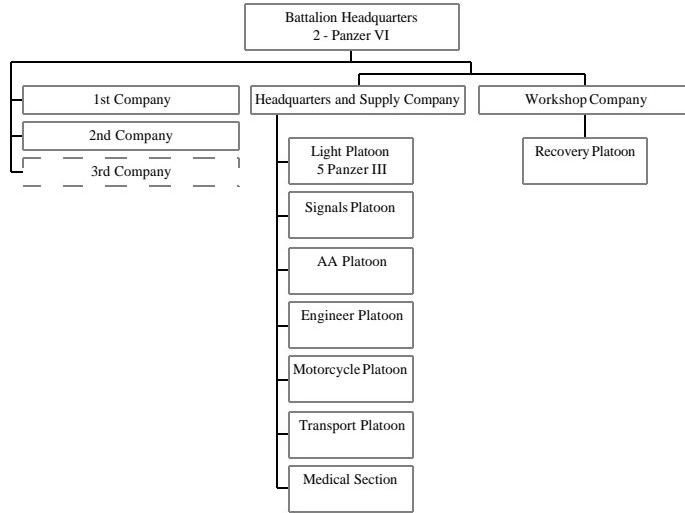


Fig. 2. Heavy Tank Battalion, D Organization: 1942-1943.

Source: See Gudgin, *The Tiger Tanks*, 92; Jentz, *Tiger I & II: Combat Tactics*, 24-25; Schneider, *Tigers in Combat I*, 79, 147, 228.

Note: According to Jentz, the K.St.N. authorized only five Panzer IIIs in the light platoon, however, it appears that the light platoons were issued ten Panzer IIIs in every one of the first three heavy tanks battalions.

The light platoons were subordinated to the headquarters company but presumably worked directly for the battalion commander during combat. The K.St.N. for

these platoons also failed to specify which model of Panzer III was authorized. This platoon could be used to reinforce the tank companies against infantry attacks or could be used to screen a flank of the battalion.

The focus on finding a mixture of vehicles and an organization that worked best seems to have continued at the battalion level when using the light platoon. Three of the first four battalions fielded, s.Pz.-Abt. 501, 502, and 504, retained the light platoon under the control of the battalion as it was originally intended.³⁷ S.Pz.-Abt. 503 formed a battalion light platoon consisting of five Panzer IIIs. The remainder of the battalion's Panzer IIIs allowed each company to form a "heavy" platoon of three Tigers and one Panzer III, as well as a light platoon.³⁸

The first five battalions created were fielded under the D battalion organization. These battalions fought in Tunisia against British and U.S. forces, as well as in the Caucasus and around Leningrad against Soviet forces. These units' after action reports indicated that the mix of light and heavy tanks allowed these battalions a higher degree of flexibility. These reports also stated that the Panzer III did not have enough armor to conduct offensive missions against prepared defensive positions with the Tiger.

On 5 March 1943, the General Staff issued a new K.St.N. for the heavy tank company and the heavy tank battalion. This new organization, K.St.N. 1176e, formed a heavy tank company of fourteen tanks, all Tigers (see figures 3 and 4). This new K.St.N. reduced the number of platoons within each company from four to three, and maintained the number of companies authorized within the battalion at three.

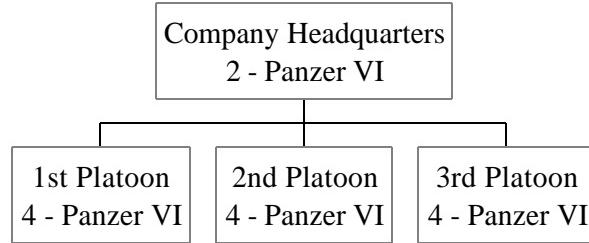


Fig. 3. Heavy Tank Company, K.St.N. 1176e Dated 5 March 1943.
Source: Jentz, *Tiger I & II: Combat Tactics*, 26.

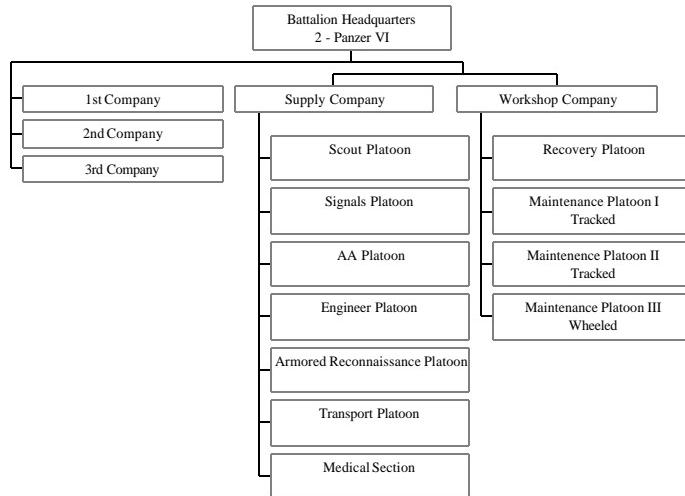


Fig. 4. Heavy Tank Battalion, E Organization: 5 March 1943.
Note: There are several different versions of the battalion organization. This is probably due to the fact that when one of the sub-units changed its K.St.N., the overall battalion would change also. Numerous small changes were made to the elements of the battalion within the headquarters company and the supply company, creating different battalion K.St.N.s. This makes it extremely difficult to identify a single battalion organization. This was developed from Wolfgang Schneider's *Tigers in Combat I*, Thomas L. Jentz's *Tiger I & II: Combat Tactics*, and Peter Gudgin's *The Tiger Tanks*.

Because the Army General Staff planned to field all three authorized tank companies, the workshop and headquarters companies separated and increased in size. The workshop company increased to three maintenance platoons and a recovery platoon.

The new battalion organization also did away with the light tank platoon within the battalion, but they gained an abundance of reconnaissance assets. This new organization added an armored reconnaissance platoon with half-tracks as well as a scout platoon. With three heavy tank companies and the battalion headquarters element, the new E battalion organization was authorized forty-five Tiger tanks. This was possible because of increased production of the Tiger.

The increased Tiger production allowed the German military to field even more heavy tank battalions. On 8 May 1943, s.Pz.-Abt. 506 was created using the new heavy tank battalion organization. Three of the first five battalions created changed to the E organization shortly after the new K.St.N. was published. Two of these, s.Pz.-Abt. 503 and 505 were almost complete by the time they fought in Operation CITADEL in July 1943. The third battalion, s.Pz.-Abt. 502, changed to the E organization by the end of June 1943. In September 1943, three more heavy tank battalions, s.Pz.-Abt. 507, 508, and 509, were created using this new organization. Also, during September 1943, the German Army re-established s.Pz.-Abt. 501 and 504 as E heavy battalions because they had been destroyed, captured, or reduced from combat.³⁹

The German Army created a heavy tank battalion for the elite Panzer Grenadier Division *Grossdeutschland* in the spring of 1943.⁴⁰ This battalion has the distinction of being the only heavy tank battalion assigned permanently to a division.⁴¹ The battalion was assigned as the 3d battalion of the division's panzer regiment. This battalion was organized under the E battalion organization and theoretically had forty-five Tigers assigned. Because this unit was in almost continual combat from the day that it was organized, it never reached its full strength.⁴² The last heavy tank battalion created on 6

June 1944 was s.Pz.-Abt. 510. This unit immediately deployed to and fought on the Eastern Front.⁴³

In addition to increasing the number of army heavy tank battalions, the SS began authorizing heavy tank battalions to the Waffen SS. These heavy tank battalions were developed from the heavy tank companies that were already formed and fighting with units like the *Leibstandarte*, *Das Reich*, and *Totenkopf*. On 22 October 1943, heavy SS tank battalions (s.SS Pz.-Abt.) 101 and 102 were created but they were not fully fielded and combat capable until April and May 1944, respectively.⁴⁴ The third and last SS heavy battalion, s.SS Pz.-Abt. 103, was created on 1 July 1943. The SS used it as infantry in Yugoslavia until January 1944 because it did not have vehicles.⁴⁵ It finally reached nearly full strength in January 1945 and fought in the last battles of the war.⁴⁶

All of the SS heavy tank battalions eventually changed their designations to 501, 502, and 503. This led to some confusion that also caused the army to change the unit numbers for their first three heavy tank battalions. The primary difference between the SS heavy tank battalions and the army ones was the fact that the SS units were assigned directly and permanently to a corps. For instance, s.SS Pz.-Abt. 501 was assigned to the 1st SS Panzer Corps.⁴⁷

The final variation of the army heavy tank battalions was the inclusion of s.Pz.-Abt. 503 into the Panzer Corps “*Feldherrnhalle*” on 19 December 1944.⁴⁸ This was similar to the Waffen SS heavy tank battalions because the unit was an integrated and permanent part of the corps. Officially, the battalion’s name changed to s.Pz.-Abt. “*Feldherrnhalle*” or (FHH) but because the name implied close association with the Nazi party, the unit maintained the designation “503” throughout the war.⁴⁹

The General Staff issued a new K.St.N. when the first Tiger II was produced in November 1943 for both the headquarters element and the heavy tank company. The only change to the previous version of the E organization was that heavy tank companies and battalions were now authorized either the Tiger or the Tiger II tank.⁵⁰

Ten heavy tank battalions received some Tiger IIs before the war ended.⁵¹ Of these, only six received the full complement of forty-five Tiger tanks authorized in the organization.⁵² These units continually rotated to different theaters and most often, received only a handful of Tiger IIs at a time. This meant that only a few heavy tank battalions ever fielded the full complement of forty-five Tiger IIs at the same time.

Throughout the war, heavy tank battalions were organized and equipped using either the D or E organizational structures. The majority of the Army battalions, as Army level units, were employed by the OKH. The Waffen SS and several of the special army battalions were treated differently and assigned to a permanent headquarters, in most cases to a corps. Units produced successful results using both organizations. Even though the D organization allowed the heavy tank battalion to accomplish a wider variety of missions and gave it more flexibility, the Army General Staff implemented the E organization for all heavy tank battalions. This organization, with pure Tiger companies, was more suited for fighting the breakthrough battle.

Equipment

The first mention of a panzer above thirty tons is included in a doctrinal report dated 30 October 1935 by General Liese, head of the Army Ordnance Department. He established the requirements for this vehicle as having armor protection up to twenty

millimeters thick and for it to be armed with a seventy-five-millimeter main gun, making it capable of defeating the French Char 2 C, 3 C, and D tanks.⁵³

Even though the army ordnance department put forth the requirement for a heavy tank, in terms of weight, this developing vehicle changed names frequently. This was probably due to the continuing doctrinal debate about how to employ armor and what types of tanks should be used for the different missions. In November 1936, the automotive design office of the Army Ordnance Department requested that Krupp create a conceptual design of the thirty ton tank. This tank was called a Escort Tank (strengthened), implying that it would escort lighter panzers. On 12 March 1937, the Army Ordnance Department officially changed the name to Infantry Tank, which implied that it was intended to support the infantry. On 28 April 1937, the automotive design office of the Army Ordnance Department directed that the name again be changed to *Durchbruchswagen* (breakthrough or breaching tank) or D.W.⁵⁴ This name implies that a new tactical role was envisioned for these heavy tanks, to breach the enemy defenses similar to Guderian's first wave of tanks.

The D.W. underwent many name changes but was finally called the Panzer VI, or Tiger. Throughout all of the name and designation changes that followed, the code of D.W. was retained.⁵⁵ The entire heavy tank program soon came to be known as the Tiger Program and was given a high priority by the Army and Hitler.

One of the main reasons that the tank went through so many different designations was that the Army Ordnance Department kept submitting new requirements for increasing the size of the main gun. These requirements were given a national priority on 26 May 1941. On that day, a meeting took place at the Berghof in

Berchtesgaden between Hitler, representatives of the armaments industry, and military experts.⁵⁶ During this meeting, Hitler discussed the need for the development and fielding of a heavy tank. He said, “The main point is to create vehicles which, first, have greater penetrative capabilities against enemy tanks; second, which are more strongly armored than previously; and third, which have a speed which does not fall short of forty kilometers per hour.”⁵⁷

Several months later Hitler reduced the last requirement in favor of increased armor and issued more specific guidance. He praised the penetrative capabilities of the antiaircraft gun known as the eighty-eight-millimeter Flak 41 L/74. He recommended that it be improved to enable it to penetrate one hundred millimeters of armor at a range of 1,400 to 1,500 meters and be adopted as a *Kampfwagen kanone* (tank gun) or Kwk. Hitler also demanded that the frontal armor of future tanks be one hundred millimeters thick and the sides sixty millimeters thick.⁵⁸

Two firms, Henschel and Porsche, competed for the design and development of the future heavy tank.⁵⁹ Ultimately, the automotive design office of the Army Ordnance Department awarded Henschel the contract for the chassis and Krupp the contract for the turret that together made the Tiger (see table 1).⁶⁰

The Tiger was a heavy tank in both weight and in doctrinal purpose. It weighed fifty-seven tons and was armed with the eighty-eight-millimeter Kwk 36 L/56 gun, capable of penetrating one hundred millimeters of armor at 1000 meters using a *Panzergranate 39* (Pzgr. 39) (armor piercing, capped, ballistic capped with explosive filler and tracer). Although not widely available, the (Pzgr. 40) (high velocity,

subcaliber, tungsten core with tracer) could penetrate 110 millimeters of armor at 2,000 meters.⁶¹ The Tiger's primary opponents at the time that it was fielded, the T-34/76, only had forty-five-millimeters of frontal armor.⁶² Although the Tiger's frontal armor was thick, it was not sloped, making it easier to penetrate.

Table 1. *Panzerkampfwagen VI Ausf E* (Tiger I) Specifications.

Weight:	56000 kilograms (early models); 57000 kilograms (late models)
Crew:	5 men
Engine:	Maybach HL 210 P 45 - 12 cylinder / 600horsepower (early models) Maybach HL 230 P 45 - 12 cylinder / 700horsepower (late models)
Fuel Capacity:	540 liters (in four fuel tanks)
Speed:	Road 38 kilometers/hour; Cross-Country 10-20 kilometers/hour
Range:	Road: 195 kilometers; Average Terrain: 110 kilometers
Armament:	One 88 millimeter KwK 36 L/56 Gun 2 x 7.92 millimeter MG34 (early models) 3 x 7.92 millimeter MG34/42 (late models)
Ammo:	88 millimeter - 92 rounds; 7.92 millimeter - 4500-5700 rounds 25 millimeter - 40 millimeter (Top)
Armor:	80 millimeter (Side and Rear) 100 - 120 millimeter (Front)

Source: Jentz and Doyle, *Tiger Tanks, D.W. to Tiger I*, 177-181.

Development of the Tiger II was a continuation of the heavy tank program. It was developed because of the constant emphasis on armor penetration capabilities and the desire to mount the eighty-eight-millimeter Flak 41 L/74 gun or something similar in a tank turret. The eighty-eight-millimeter Kwk 36 L/56 gun mounted in the Tiger I did not meet the requirement, with the standard ammunition available (Pzgr. 39), put forth by Hitler.⁶³ Ultimately, Krupp developed the eighty-eight-millimeter Kwk 43 L/71 gun that had similar penetrative capabilities to the eighty-eight-millimeter Flak 41 L/74 gun. This

was mounted on a chassis developed by Henschel, making the Tiger II (see tables 2 and 3).

Table 2. *Panzerkampfwagen VI Ausf B* (Tiger II) Specifications.

Weight:	69,800 kilograms
Crew:	5 men
Engine:	Maybach HL 230 P 30 / 12-cylinder / 700 horsepower
Speed:	Road: 38 kilometers/hour; Cross-Country: 15 - 20 kilometers/hour
Range:	Road: 170 kilometers; Cross-Country: 120 kilometers
Fuel Capacity:	860 liters
Armament:	88 millimeter KwK 43 L/71 and 3 x 7.92 millimeter MG34/42; (1 x MG - hull); (1 x MG - coaxial); (1 x MG - cupola)
Ammo:	88 millimeter - 84 rounds (68 stowed, 16 loose on turret floor); 7.92 millimeter - 5850 rounds
Armor:	40 millimeters (Top); 80 millimeters (Side and Rear); 150 - 180 millimeters (Front)

Source: Jentz and Doyle, *Tiger Tanks, VK45.02 to Tiger II*, 152-165.

Table 3. Tiger I and Tiger II Gun Comparison.

	Tiger I: 88mm KwK 36 L/56		Tiger II: 88mm KwK 43 L/71	
Ammunition Type	Pzgr.39	Pzgr.40	Gr.39HL	Pzgr.39/43
Shell Weight (Kilograms)	10.2	7.3	7.65	10.2
Initial Velocity (meters/second)	773	930	600	1000
Penetration Capability (millimeters)				
Range	Pzgr.39	Pzgr.40	Gr.39HL	Pzgr.39/43
100 meters	120	170	90	202
500 meters	110	155	90	185
1000 meters	100	138	90	165
1500 meters	91	122	90	148
2000 meters	84	110	90	132
				152

Source: Jentz, *Tiger I & II: Combat Tactics*, 9.

Note: Penetration capability was measured in millimeters of rolled homogeneous steel plates at a thirty degree angle of impact.

Using a Pzgr. 39-1 round, the Tiger II's eighty-eight-millimeter gun could penetrate 148 millimeters of armor at a range of 1,500 meters (see table 3). Using the rare Pzgr. 40/43 round, it was capable of penetrating 170 millimeters of armor at that same range.⁶⁴

The Tiger II incorporated design and material elements, such as the engine, from the Panther tank.⁶⁵ At almost seventy tons, the Tiger II was the heaviest tank of the war. One of the principle reasons it weighed so much was that it was very heavily armored. In addition to very thick armor, its frontal armor was sloped so that it was even more difficult to penetrate.

The Tiger and Tiger II were formidable opponents and had many strengths. From the published histories of both Allied and Axis forces, very few Allied tankers willingly engaged in direct combat with a Tiger I or Tiger II. If there were other options, like bypassing or employing artillery or aircraft on the Tigers, these options were used first.⁶⁶

The Tiger and Tiger II also had a few weaknesses that were inter-related and became evident in the defensive withdrawals after 1943. One was the extensive maintenance required to keep a Tiger or Tiger II operational. The other was the Tiger and Tiger II's mobility or small radius of action. These two weaknesses caused further problems in logistics, maintenance support, and operational readiness.

Directly related to the small radius of action is the fuel consumption rate of these vehicles. Given Germany's strategic situation and its fuel shortage, the fuel required for the Tiger and Tiger II was a large operational weakness. This is clearly evident when one considers that the Tiger had a range of 195 kilometers, using 540 liters of fuel to do so. The Tiger II had a comparable range of 170 kilometers but required 860 liters of fuel to

do so. By comparison, a T-34/76 could travel 455 kilometers using only 480 liters of fuel.⁶⁷

If a vehicle did break down, was damaged in combat, or became stuck, its weight and the lack of an adequate armored recovery vehicle created a challenge in maintaining a high operational rate. Generally, recovering a Tiger in the forward areas required towing it with at least one other Tiger, although this was officially forbidden. The workshop company did have eighteen-ton half-track tractors, but two of these were required to tow one Tiger.⁶⁸ Additionally, if being towed over hilly terrain, a trail vehicle at least as large as a Panzer III was required to stabilize the Tiger so it did not become unmanageable.⁶⁹ Beginning in 1944, heavy tank battalions started to receive some armored recovery vehicles, the *Bergpanther*, in addition to keeping the eighteen-ton half-track tractors. The difficulties in recovering a damaged Tiger in combat usually resulted in it being abandoned and destroyed by its crew.

Personnel

The personnel of the heavy tank battalions came from many sources. One of the primary sources was from experienced units who were veterans of the campaigns in Poland, France and in Russia. Another source was from the Heavy Panzer Replacement and Training Battalion 500, established at Paderborn in early 1942.⁷⁰ From the creation of s.Pz.-Abt. 503 on, some of the personnel required for these units came from remnants of tank units destroyed in combat, or tank units that had rotated back to Germany or France to re-equip.

In some instances, an entire battalion from an existing unit was ordered to transition to become a heavy tank battalion. For instance, the 3d battalion of Panzer

Regiment 33 of the 9th Panzer Division transitioned to become s.Pz.-Abt. 506 on 20 July 1943. This unit had been in combat in France and in Russia since the beginning of that campaign. Similarly, the 1st battalion of Panzer Regiment 3 from the 2d Panzer Division, having served in Poland, France, the Balkans, and Russia, became s.Pz.-Abt. 507. The 1st battalion of Panzer Regiment 29 from the 12th Panzer Division became s.Pz.-Abt. 508.⁷¹ This battalion had served in Russia since the summer of 1941.

Because of a shortage of Tigers, training was carried out mainly on Panzer IV tanks at Paderborn. The recruits assigned as replacements for heavy tank battalions were almost exclusively volunteers between seventeen and eighteen years old.⁷²

The heavy tank battalions benefited from receiving veteran personnel, although replacements later in the war were young and inexperienced. The practice of transitioning entire combat experienced units to become a new heavy tank battalion must have increased the morale, esprit de corps, and cohesion. Also, because the Tiger and Tiger II were very survivable vehicles, these battalions benefited by retaining those experienced crews, even in instances where the tank was lost.

Tactics

The first three heavy tank battalions received little guidance on how to accomplish their given missions. They were given a copy of memorandum Number 87/42 from the *General der Schnellen Truppen* (general of fast troops) dated 10 February 1942. This memorandum provided only general statements on capabilities and did not go into the details of tactical employment.

The D companies and battalions, integrated with Panzer IIIs and Tigers, adhered to the following general tactical employment:

In the attack, the role of the Tiger is that of supporting the lighter tanks by fire; the latter leads, followed by the heavier Tigers, and, when contact with the enemy armor is made, the screen of lighter tanks deploys outwards to the flanks, leaving the Tigers to engage frontally. In defense, the Tiger is usually sited in a covered and defiladed position. The lighter tanks watch the flanks of positions occupied by the Tigers.⁷³

The first battalions were generally left to experiment and send reports back to the Army General Staff in order to develop further doctrine. By 20 May 1943, tactical manuals for the employment of the heavy tank company and the heavy tank battalion were published.⁷⁴ The manual for the training and employment of the heavy tank company established four primary capabilities or missions. They were: (1) to attack in the first wave against strong defenses, (2) to destroy heavy enemy tanks and other armored targets at long ranges, (3) to decisively defeat the enemy defenses, and (4) to breakthrough positions reinforced by defensive works.⁷⁵

The first half of the company manual contained sections on the organization of the heavy tank company, as well as basic gunnery principles of the Tiger tank. The second half contained sections on the platoon and company that established basic tactical guidance and outlined combat formations for both the platoon and the company. The four formations available to the platoon were the column, line, double column (or box), and wedge. The manual stated that the wedge was the formation preferred during the attack.⁷⁶ The four formations available to the company were the column (with the three platoons in column abreast), the double column (with the platoons in two columns), wedge (with one platoon forward and two platoons following), and the broad wedge (with two platoons forward and one platoon following).⁷⁷ The manual stated that the

broad wedge was the most useful attack formation and when the company deployed in this formation, it occupied an area 700 meters wide and 400 meters deep.⁷⁸

The manual provided guidance to overcome the large fuel consumption of the Tiger's by stating that "after leaving the assembly area it is often necessary to take a short halt within our own line to again refuel in order to be able to totally exploit the small radius of action in enemy territory."⁷⁹

The company manual placed emphasis on tank versus tank combat by including an entire subsection on it. It stated that "the most important task of the heavy tank company is the engagement of enemy tanks. It always has priority over every other assignment."⁸⁰ Emphasis on the offensive was evident by noting that the only reference that could even remotely be considered defensive in nature is the last sentence of the manual, which stated "knocked-out or immobilized enemy tanks are to be blown up during retreats."⁸¹

The manual for the heavy tank battalion was much shorter than the heavy tank company manual. It contained only two sections covering: (1) purposes, tasks, and organization and (2) employment. Portions of the first section included doctrinal and tactical guidance such as:

The Tiger Battalion is therefore a powerful decisive point weapon in the hands of the troop commander. Its strength lies in concentrated, ruthlessly conducted attacks. Each dispersion reduces its striking power. Basic preparations for employment at decisive locations guarantee great success. Tiger Battalions are Army Troops. They will be attached to other Panzer units in the decisive point battle in order to force a decision. They may not be used up too early from being employed for secondary tasks. They are especially suited for fighting against heavy enemy tank forces and must seek this battle. The destruction of enemy tanks creates the prerequisite for the successful accomplishment of the tasks assigned to our own lighter Panzers.⁸²

The focus was on defeating enemy tanks, and the guidance was fairly clear that the heavy tank battalions should not be assigned missions that did not involve enemy tank formations.

The entire heavy tank battalion manual was surprisingly general and did not focus solely on offensive missions like the heavy tank company manual did. Instead of purely offensive words like “breakthrough,” the manual used terms like decisive point and decisive action. An interesting comment considering the extremely limited radius of action of a Tiger was “the Tiger is especially suitable for pursuit.” It continued by stating that “preplanned scouting and early stockpiling of fuel and ammunition are the prerequisites for this.”⁸³

Worthy of note for its absence was the lack of any section in the heavy tank battalion manual on formations for the battalion as a whole. There were several paragraphs that discussed the employment of some of the separate platoons of the battalion. These statements were very general and do little to provide real guidance to the battalion commander. For instance, “the armored reconnaissance platoon is to be sent in by the battalion commander for combat reconnaissance” was the total amount of guidance for employment of that platoon.⁸⁴ Similarly vague and obvious guidance of “timely deployment . . . and close cooperation with these (the engineer platoon) to determine and clear mines and obstacles are necessary” was included for the engineer platoon.⁸⁵

The German Army published an instruction pamphlet for army and corps level commanders to guide them in the correct employment of the heavy tank battalion. The pamphlet, organized in twenty-five points, stated that all guidance was based upon the

characteristics of the Tiger and the purpose for which it was created. Because the Tiger had a limited radius of action and required a great deal of maintenance, the pamphlet included the following guidance:

1. Close liaison of Tiger commander with the operationally responsible command headquarters (is necessary). Reason: Long-range disposition is indispensable to the tiger units. All pre-operation preparations (reconnaissance and supply) require more time than with other weapons.
2. Issue orders for movement or action to Tiger commanders as early as possible. Reason: As in 1.⁸⁶

This pamphlet emphasized the importance of this unit in the breakthrough and provided guidance to keep the heavy tank battalion informed of its mission.

Also, the pamphlet discussed the concept of breakthrough by the heavy tank battalion and exploitation by lighter, faster, forces in the following waves.

3. As a general principle, issue orders to the Tiger commanders first. Reason: The tiger is the carrier of the breakthrough. They are to be incorporated in the first strike at the point of main effort.
4. Never place a Tiger unit under the command of an infantry division in an attack. Reason: In difficult situations contact breaks down between division and battalion. The infantry division lacks troops which, on the basis of their equipment and experience, can fight with and keep pace with the Tigers. In most cases the Tigers' success cannot be exploited by the infantry and the conquered territory cannot be held.
11. As a general principle, employ the Tiger unit in coordination with other weapons. Reason: Following the penetration, it is the Tiger's task to push through to the enemy artillery and smash it. All other weapons must support them toward reaching this objective. Simultaneously, light tanks and assault guns are to smash the enemy's heavy infantry weapons and antitank guns. Our own artillery suppresses the enemy artillery and covers the flanks. Panzer grenadiers follow mounted on the tanks and occupy the conquered territory. They protect the Tigers against close-in attack by enemy infantry. Light tanks exploit the success and expand the tactical penetration into a strategic breakthrough.⁸⁷

In keeping with the German Army's concept for the employment of tanks formulated by Guderian, the pamphlet discussed the need to concentrate the battalion in order for it to achieve its mission.

10. The Tiger unit must be the commander's main weapon for the decisive action. Reason: Concentrated employment of the Tiger unit at the point of main effort forces the success. Any dispersal of forces places it in question.⁸⁸

The authors of the pamphlet realized the deficiencies and weaknesses of the Tiger. These included its weight, which limited the bridges it could use to cross rivers, and its high maintenance requirements. Because of these weaknesses, the pamphlet stated:

- Movement. As much as possible allow the Tigers to move alone.
5. Reason: The stress on the automotive parts of the Tiger are least when it is given the opportunity to drive quickly without changing gears, braking and restarting. The Tiger also disturbs the movement of other units. Bottlenecks, bridges and fords often present surprises for the Tigers through which traffic can become completely blocked.
 7. Do not request forced marches. Reason: The result will be high wear on the engine, transmission and running gear. The Tiger's combat capability will thus be used up on the road and not in action. The average speed for a Tiger unit is ten kilometers per hour by day and seven kilometers per hour by night.
 8. Have tanks travel as little as possible. Reason: During movements the great weight of the Tiger results in considerable material wear.
 24. Following prolonged action, allow the Tiger battalion two to three weeks to restore its fighting power. Reason: Otherwise the percentage of technical breakdowns will climb increasingly in subsequent operations.⁸⁹

As with other doctrinal guidance, this pamphlet focused on offensive operations, but did provide some guidance relevant to defensive operations. The focus of the pamphlet was on the concentration of all tanks in the decisive action. This could be adapted to offensive breakthroughs or to mobile counterattacks conducted while in an overall defensive posture.

The sections on movement and maintenance are important when considering using the heavy tank battalion as a mobile reserve in the defense. Because of the high maintenance requirements, positioning of the heavy tank battalion as a mobile reserve

was very important so it could counter enemy penetrations of the defensive line with the least amount of movement. This was especially true across the vast distances of the Eastern Front.

Summary

Based upon the published German doctrine and the Tiger program guidance, the heavy tank battalion was formed with the primary focus of killing tanks. German doctrine envisioned a decisive tank battle once a penetration of the initial defensive line had been made. The heavy tank battalion was developed and fielded to fight that decisive tank battle. Originally, it was intended to fight that battle on the offensive during the breakthrough battle, but it was also capable of fighting from the defensive by counter-attacking enemy armor penetrations as a mobile reserve.

¹Heinz Guderian, *Achtung-Panzer! The Development of Armoured Forces, their Tactics and Operational Potential*, trans. Christopher Duffy with an introduction by Paul Harris (London: Arms and Armour Press, 1995), 168.

²Bryan Perret, *A History of Blitzkrieg*, with a foreword by General Sir John Hackett (New York: Jove Books, 1989), 66.

³Heinz Guderian, *Panzer Leader* (Erinnerungen eines Soldaten), trans. by Constantine Fitzgibbon with a foreword by B. H. Liddell Hart (New York: E. P. Dutton & Company, Inc., 1952), 20.

⁴Perret, *A History of Blitzkrieg*, 60.

⁵“Nutzanwendungen aus der Tankschlacht von Cambrai II,” *Militär-Wochenblatt* No. 24, (1929), in *Imagining War: The Development of Armored Doctrine in Germany and the Soviet Union, 1919-1939*, Mary Ruth Habeck (Ann Arbor, Michigan: UMI Dissertation Services, 1996), 153.

⁶Ludwig Beck, “Nachtragliche Betrachtungen zu dem Einsatz des Panzerkorps in der Lage der Truppenamsreise vom 13.6.1935” in *Imagining War*, by Habeck, 313-314.

⁷Heinz Guderain, “Die Panzertruppen und ihr Zusammenwirken mit den anderen Waffen,” in *Imagining War*, Habeck, 335.

⁸Guderian, *Achtung-Panzer!*, 170.

⁹Ibid.

¹⁰Ibid.

¹¹Ibid., 179.

¹²Ibid.

¹³Ibid.

¹⁴Ibid.

¹⁵Ibid.

¹⁶Albert Kesselring and others, eds., *Manual for Command and Combat Employment of Smaller Units*. MS #P-060b. trans. G. Weber and W. Luetzkendorf, ed. G. C. Vanderstadt (Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1952), 115.

¹⁷Ibid., 115-116.

¹⁸Ibid., 116.

¹⁹Ibid., 175.

²⁰Ibid.

²¹Jentz, *Panzertruppen: 1933-1942*, 63.

²²Ibid., 64-65.

²³Ibid., 69.

²⁴Rolf Moebius, *German Heavy Armor*, MS #D-226. Draft Translation (Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1954), 2.

²⁵Ibid., 3.

²⁶Jentz, *Tiger I & II: Combat Tactics*, 23.

²⁷Gudgin, *The Tiger Tanks*, 91.

²⁸Egon Kleine and Volkmar Kuhn, *Tiger: The History of a Legendary Weapon, 1942-45*, trans. David Johnston (Winnipeg, Manitoba: J. J. Fedorowicz Publishing, 1989), 9.

²⁹Gudgin, *The Tiger Tanks*, 91.

³⁰Jentz, *Tiger I & II: Combat Tactics*, 24-25.

³¹Ibid.

³²Ibid., 25-26.

³³Wolfgang Schneider, *Tigers in Combat I* (Winnipeg, Manitoba: J. J. Fedorowicz Publishing, 2000), 147.

³⁴Ibid., 79, 228, 264, 312.

³⁵Gudgin, *The Tiger Tanks*, 93.

³⁶Jentz, *Tiger I & II: Combat Tactics*, 24.

³⁷Schneider, *Tigers in Combat I*, 79, 147, 264.

³⁸Dr. Franz-Wilhelm Lochmann and others, eds., *The Combat History of Schwere Panzer-Abteilung 503: In Action in the East and West with the Tiger I and Tiger II* (Winnipeg, Manitoba: J. J. Fedorowicz Publishing, 2000), 14.

³⁹Ibid, 27.

⁴⁰Hans-Joachim Jung, *Panzer Soldiers for “God, Honor, Fatherland,” The History of Panzerregiment “Grossdeutschland:” The German Army’s Elite Panzer Formation*, trans. David Johnston (Winnipeg, Manitoba: J. J. Fedorowicz Publishing, 2000), 145.

⁴¹Others, like s.Pz.-Abt. 501 and 504 were attached to the 10th Panzer Division temporarily while fighting in Tunisia.

⁴²Wolfgang Schneider, *Tigers in Combat II* (Winnipeg, Manitoba: J. J. Fedorowicz Publishing, 1998), 3. The Panzerregiment already had a heavy tank company assigned that was fighting in the battle of Kursk when the rest of the battalion was forming in Germany.

⁴³Schneider, *Tigers in Combat I*, 443.

⁴⁴Schneider, *Tigers in Combat II*, 3, 6-7.

⁴⁵Jentz, *Tiger I & II: Combat Tactics*, 27.

⁴⁶Schneider, *Tigers in Combat II*, 7.

⁴⁷Patrick Agte, *Michael Wittman and the Tiger Commanders of the Leibstandarte*, trans. David Johnston (Winnipeg, Manitoba: J. J. Fedorowicz Publishing, 1996), 216.

⁴⁸Lochmann et al., *Combat History of Schwere Panzer-Abteilung 503*, 309.

⁴⁹Ibid.

⁵⁰Jentz, *Tiger I & II: Combat Tactics*, 27.

⁵¹Gudgin, *The Tiger Tanks*, 133.

⁵²See Schneider, *Tigers in Combat I*, 82, 152, 231, 314, 346-347, 374, 441; idem, *Tigers in Combat II*, 364, 324-325, 397.

⁵³Jentz and Doyle, *Tiger Tanks: D.W. to Tiger I*, 9.

⁵⁴Ibid., 10.

⁵⁵Ibid., 12.

⁵⁶Ibid., 25, 30.

⁵⁷Kleine and Kuhn, *Tiger*, 4.

⁵⁸Ibid.

⁵⁹Jentz and Doyle, *Tiger Tanks: D.W. to Tiger I*, 12, 23.

⁶⁰Ibid., 19-20, 67, 69.

⁶¹Jentz, *Tiger I & II: Combat Tactics*, 9-10.

⁶²Thomas L. Jentz, *Panzertruppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1943-1945* (Atglen, Pennsylvania: Schiffer Publishing, Ltd., 1997), 295.

⁶³Thomas L. Jentz and Hilary L. Doyle, *Germany's Tiger Tanks: VK45.02 to Tiger II* (Atglen, Pennsylvania: Schiffer Publishing, Ltd., 2000), 10.

⁶⁴Jentz, *Panzertruppen: 1943-1945*, 296.

⁶⁵Jentz and Doyle, *Tiger Tanks: VK45.02 to Tiger II*, 59.

⁶⁶David Fletcher, *Tiger! The Tiger Tank: A British View* (London: Her Majesty's Stationery Office, 1986), 228.

⁶⁷Jentz, *Panzertruppen: 1943-1945*, 294-295.

⁶⁸Gudgin, *The Tiger Tanks*, 49.

⁶⁹Major Lueder, Commander of the 501st Heavy Tank Battalion, “Tiger Experiences in Tunisia,” dated 18 March 1943 in *Tiger I & II: Combat Tactics*, Jentz, 59.

⁷⁰Gudgin, *The Tiger Tanks*, 93-94.

⁷¹Schneider, *Tigers in Combat I*, 315, 349, 375.

⁷²Kleine and Kuhn, *Tiger*, 39.

⁷³Gudgin, *The Tiger Tanks*, 107.

⁷⁴Jentz, *Tiger I & II: Combat Tactics*, 23, 31-37.

⁷⁵Merkblatt 47a/29 (20 May 1943) in *Tiger I & II: Combat Tactics*, Jentz, 31-32.

⁷⁶Ibid., 32-33.

⁷⁷Ibid., 34-35.

⁷⁸Ibid., 34.

⁷⁹Ibid., 36.

⁸⁰Ibid.

⁸¹Ibid.

⁸²Merkblatt 47a/30 (20 May 1943) in *Tiger I & II: Combat Tactics*, Jentz, 36-37.

⁸³Ibid., 37.

⁸⁴Ibid.

⁸⁵Ibid.

⁸⁶Kleine and Kuhn, *Tiger*, 41-42.

⁸⁷Ibid.

⁸⁸Ibid.

⁸⁹Ibid.

CHAPTER 3

BIRTH OF HEAVY TANK BATTALIONS TO OPERATION CITADEL

Despite its impressive size, armament which easily outperformed that of any Allied tank of its period and armor thickness equaled only by the Churchill, the Tiger was not reliable and had a very short range of action of about forty miles across country; it was also too complicated for mass production in wartime.¹

Peter Gudgin, *Armoured Firepower*

From May 1942 until the Battle of Kursk in July 1943, the German Army created and fielded five heavy tank battalions.² The initial combat actions involved s.Pz.-Abt. 502 in August 1942. They attacked as part of Army Group North in the vicinity of Leningrad. One company of s.Pz.-Abt. 504 and all of s.Pz.-Abt. 501 fought in Tunisia from November 1942 until the surrender of German forces in May 1943. These battalions were piecemealed into battle as their platoons and companies arrived because of the deteriorating tactical situation for the Germans in both theaters.

S.Pz.-Abt. 503 participated as part of Army Group Don in attempting to stop the Soviet advance following the encirclement of the German 6th Army in Stalingrad.³ During Operation CITADEL (the attack at Kursk), OKH committed the only two fully operational heavy tank battalions. These were s.Pz.-Abt. 503 and 505 and were the only heavy tank battalions remaining because s.Pz.-Abt. 501 and 504 had been destroyed or captured in Tunisia and Sicily and were being rebuilt in Germany. At the same time, s.Pz.-Abt. 502 only had one under strength company with Army Group North.⁴

S.Pz.-Abt. 502 with Army Group North

In the summer of 1942, Hitler ordered the first company of s.Pz.-Abt. 502 to Army Group North to assist in the capture of Leningrad. This company, along with

elements of the workshop company and battalion headquarters, conducted combat operations in the vicinity of Leningrad beginning at the end of September 1942. The 2d company of this battalion wasn't formed until later, and in an attempt to stabilize the front after the Soviet encirclement of Stalingrad, OKH attached them to Army Group Don in early 1943.⁵ The 1st company of s.Pz.-Abt. 502 fought in the vicinity of Leningrad with Army Group North until the battalion was reunited in the summer of 1943 after having been refitted in accordance with the E battalion K.St.N.⁶

As historian Egon Kleine points out, “there is scarcely a historical work on the Russian campaign that does not mention the first Tiger operation . . . [and they all] offer different versions of the events.”⁷ A common theme in all accounts was criticism about employing heavy tanks in terrain that was swampy and did not allow maneuver off most roads. Guderian summarized the lessons learned from the employment of this company with Army Group North in *Panzer Leader*:

He [Hitler] was consumed by his desire to try his new weapon. He therefore ordered that the Tigers be committed in a quite secondary operation, in a limited attack carried out in terrain that was utterly unsuitable; for in the swampy forest near Leningrad heavy tanks could only move in single file along the forest tracks, which, of course, was exactly where the enemy antitank guns were posted, waiting for them. The results were not only heavy, unnecessary casualties, but also the loss of secrecy and of the element of surprise for future operations.⁸

During this initial attack, all of the Tigers received some damage, and the Soviets captured one Tiger. Even though the Tiger was superior to any Soviet tank at that time, several subsequent attacks achieved similar results because the Soviets positioned anti-tank guns in depth along the few roads in the area.

During the next year, the Soviets launched several attacks that forced the Germans in this sector onto the defensive. The swampy terrain that restricted heavy

vehicle movement to roads enabled this company to provide excellent defensive support throughout the sector. Because the Soviets did not possess a tank or armored vehicle capable of defeating the Tigers, except at close range, Tigers dominated the battlefield in the restricted terrain.⁹ From 12 January to 31 March 1943, this company destroyed 160 Soviet tanks and lost 6 Tigers.¹⁰ This means that 26.7 enemy tanks were destroyed for the loss of each Tiger. This unit was obviously very effective in destroying enemy armored units attempting to penetrate the German front lines.

As most heavy tank battalions did, this unit suffered from inadequate recovery assets and a low operational readiness rate of Tigers. The unit never had more than four operational Tigers at the same time during this entire period.¹¹ Three of the six Tigers lost were destroyed by their own crews; two of them after they had become stuck in the “peat-bog” and one because of mechanical failure.¹² This may have been a result of the poor terrain, but sufficient recovery assets might have compensated for some of the losses. The unit’s diary is filled with entries about pulling out “bogged” Tigers and there is one instance where the recovery took three days.¹³

Heavy Tank Battalions in Tunisia

After the British victory at El Alamein in late October and early November 1942 and the Allied TORCH landings during that same period, *Panzerarmee Afrika* was forced onto the defensive and withdrew toward ports in Tunisia. As a result of the emphasis placed upon this theater by Hitler, OKH ordered s.Pz.-Abt. 501 to North Africa. The first elements landed in Bizerte, Tunisia on 23 November 1942. Because of Allied pressure on the ports and airfields in Tunisia, elements of the battalion formed part of an ad hoc

battle group immediately upon disembarking, fighting its first action on 1 December 1942.¹⁴

S.Pz.-Abt. 501 engaged in small offensive and defensive counterattacks until 17 March 1943. On 26 February it became the 3d Battalion of the 7th Panzer Regiment of the 10th Panzer Division.¹⁵ The remnants of the battalion, eleven Tigers, were transferred to the newly arrived s.Pz.-Abt. 504 on 17 March 1943.

This unit fought in many small actions and some large scale attacks such as Operations SPECIAL MESSENGER I, SPRING BREEZE, and OX HEAD (see figure 5).¹⁶ Combat actions usually involved elements of the battalion no larger than a company. One of the largest consolidated actions of the battalion occurred during Operation SPECIAL MESSENGER I, when the battalion fielded thirteen Tigers, although they were attached to two separate units in three groups.¹⁷ Another large scale employment of the entire battalion occurred during Operation OX HEAD where the battalion fielded fourteen Tigers as part of Panzer Regiment 7 of the 10th Panzer Division, in its attack toward Beja.¹⁸

One of the reasons for the piecemeal employment of the battalion was the fact that the individual vehicles arrived over a six week period from late November to early January.¹⁹ German forces employed combat vehicles as soon as they were available because of repeated Allied attacks that were pressuring the Germans to withdraw toward Tunis. Another reason for the piecemeal employment was that the heavy tanks of the battalion were needed in many places to stop the penetrations of the U.S. and British forces. The final reason was that this unit was plagued by a low operational rate of Tigers during its time in North Africa. Of the twenty-two Tigers assigned to s.Pz.-Abt.

501 throughout this time, the highest number operational at the same time was fourteen Tigers, on 26 February 1943.²⁰ The battalion maintained a 62 percent operational rate for Tigers throughout its time in Tunisia.²¹

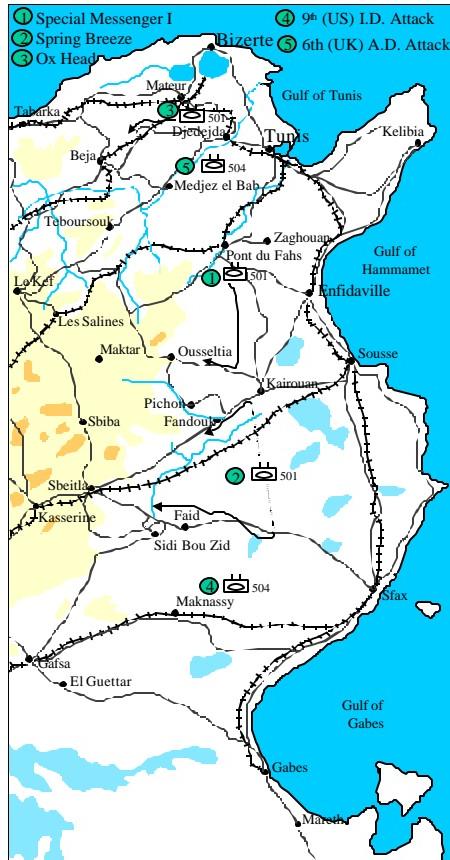


Fig. 5. Heavy Tank Battalions in Tunisia.

This low rate was due in part because the Tiger was a new weapon that had small design problems that required modifications. The combat elements of the battalion, possibly because they were given a higher priority in shipment to Tunisia than the

support units, arrived in Tunisia before any support units of the battalion. This forced the heavy tank companies to operate for an extended period of time without any dedicated maintenance support. The first maintenance platoon from the workshop company did not arrive until 25 December 1942.²² This absence of support severely hindered the battalion's ability to not only maintain its vehicles, but also to recover and tow them back from the front to be repaired. Additionally, because the Allies often interdicted the Axis supply lines in the Mediterranean, there was always a shortage of repair parts.

S.Pz.-Abt 501 improvised as best it could to maintain its tanks, but it was especially challenged because they were the only unit in North Africa equipped with the Tiger. On 18 January 1943 a Tiger that had hit a land mine was officially scrapped because the battalion lacked the replacement idler wheel to fix it.²³ This Tiger was cannibalized to establish a reserve of necessary repair parts for the other damaged Tigers.

An additional problem created by the dispersal of the battalion was that the maintenance elements were also necessarily dispersed. Because the maintenance elements were spread out, the battalion's eighteen-ton recovery vehicles found it difficult to provide support to all areas. Also, the eighteen-ton recovery vehicles did not have armor protection, so they could only recover and tow a Tiger in a secure area.

The lack of an armored recovery vehicle and of towing vehicles in general forced the battalion to destroy some disabled Tigers that may have otherwise been recovered. The battalion again improvised as best it could and in one instance, a single Panzer III towed a disabled Tiger out of the effective range of the enemy antitank guns and infantry weapons.²⁴

S.Pz.-Abt. 501 destroyed more than 150 Allied tanks in North Africa while losing only eleven Tigers.²⁵ The battalion turned over the remaining eleven Tigers to s.Pz.-Abt. 504.²⁶ This gives the battalion a kill ratio of 13.6 enemy tanks destroyed for every Tiger lost. Most sources do not differentiate the kills of the Panzer IIIs between those of the Tigers, but the unit diary is filled with specific entries that indicate the kills of the day were by the Tigers. There are no entries that specifically mention the Panzer IIIs destroying an enemy tank.²⁷ Regardless of vehicle type, the high kill ratio is a testament to the unit's effectiveness in spite of the inability, except for a few instances, to operate as a consolidated battalion.

Even though the primary tank killer of the heavy tank battalion was the Tiger, the reports continually emphasized the necessity of incorporating the Panzer IIIs within the battalion. The battalion commander stressed that the battalion "constantly needs light panzers for maintaining contact with other units, reconnaissance, and other similar duties (i.e., scouting, guarding, bringing repair parts or retrieving wounded under fire) that you can't use Tigers for."²⁸

Another indication of the effectiveness of this unit is the fact that of the eleven Tigers lost, only three were destroyed by enemy fire. Another was hit by an artillery round causing a fuel leak that eventually caused it to burn completely. The remaining seven Tigers were lost during Operation OX HEAD when they were immobilized by an extensive minefield and could not be recovered.²⁹ Strong counterattacks by the Allies prevented the German infantry attacks from advancing far enough to recover the damaged Tigers, and they all had to be blown up to prevent the enemy from towing them away.³⁰

Even with only a few Tigers, s.Pz.-Abt. 501 helped the unit it supported meet its objective during most missions. German reports indicate that the Allied forces recognized the superiority of the Tiger and did not attempt to engage it frontally, if at all. On one of the first battalion attacks toward Medjerda, the battalion reported that “the objective was reached without encountering any enemy activity,” but that “fleeing enemy columns and tanks were observed as soon as the Tigers appeared.”³¹ Evidently in an attempt to counter this and destroy more enemy tanks before they could escape, the battalion commander issued the guidance that: “Tigers may not open fire too early against enemy tanks, in order to keep retreating enemy tanks within the effective range of our weapons as long as possible.”³²

Because the Allied forces did not have a tank that could counter the Tiger, they resorted to the tactic of pulling back from ridge to ridge while laying minefields that were guarded with antitank guns. These mines were overwatched with artillery that fired upon the Tigers when they were slowed by the minefields.³³ This tactic was very effective and is similar to the situation encountered by the battalion during Operation OX HEAD, where seven Tigers were lost.

S.Pz.-Abt. 504 took possession of the remaining eleven Tigers of s.Pz.-Abt. 501 on 17 March 1943 and received eleven Tigers of their own before surrendering on 12 May 1943.³⁴ During this time, they encountered many of the same problems as their predecessor, although German forces were primarily on the defensive during the two months s.Pz.-Abt. 504 fought in North Africa. They assisted in stopping the breakthrough of the 9th US Infantry Division in the vicinity of Maknassy on 20 March 1943 (see figure 5).³⁵ They also helped temporarily stop the British offensive in the

vicinity of Medjez el Bab, as well as numerous other smaller defensive engagements.³⁶

This battalion did not engage in any large-scale offensive operations. It was tasked with defensive missions to defeat enemy penetrations of the front line. The battalion also counterattacked several times, as part of a larger German force, to re-establish the front line positions.

The battalion was only able to maintain around a 50 percent operational rate for their Tigers, and the largest number of Tigers that were operational at one time was seventeen on 4 April 1943.³⁷ They lost a total of eight Tiger tanks between 17 March and 12 May 1943, and destroyed the remaining fourteen in order to prevent their capture before surrendering to Allied forces.³⁸ During the two months that they operated in Tunisia, s.Pz.-Abt. 504 destroyed more than 150 enemy tanks.³⁹ Prior to destroying the fourteen remaining Tigers, the battalion achieved a tank kill ratio of 18.8 enemy tanks for every Tiger lost. Because the entire battalion was lost to the German Army, the kill ratio measured against all twenty-two Tigers committed was still a respectable 6.8 enemy tanks destroyed for every Tiger lost.

This battalion's counteroffensive actions were effective in delaying the Allied forces in Tunisia. They could have been even more cost effective had the German Army been able to evacuate the remaining Tigers of the battalion to Sicily or Italy.

This battalion, like s.Pz.-Abt. 501, also suffered from inadequate recovery assets during its retrograde actions. Of the eight Tigers lost prior to surrendering, only four were lost as a result of direct enemy contact.⁴⁰ Of these four, the battalion destroyed two because they were unable to recover them. That meant that enemy fire completely

destroyed only two Tigers, one from concentrated antitank and artillery fire, and the other from a direct hit by an artillery round.⁴¹

This testifies to the survivability of the Tiger tank, but it also highlights its weaknesses. The Tiger, as the Germans were discovering, was a very maintenance intensive combat vehicle that had a limited radius of action because of the high fuel and maintenance requirements. These weaknesses were exacerbated when the Germans withdrew following the Allied offenses in Tunisia.

Although the actions of s.Pz.-Abt. 504 indicate that they were effective in destroying enemy tanks, if the German Army had devoted some resources to developing an armored recovery vehicle, they may have been able to reduce the number of Tigers destroyed by their own crews. Only two Tigers were total and complete losses on the battlefield as a result of direct combat. For the loss of these two Tigers, the battalion destroyed over 150 Allied tanks, which equals a kill ratio of 75 to 1.

S.Pz.-Abt. 503 with Army Group Don in Southern Russia

On 27 December 1942, s.Pz.-Abt. 503 was sent to Army Group Don to assist in stabilizing the front.⁴² This unit was needed to help protect Rostov so that the 1st and 4th Panzer Armies and other German units in the Caucasus could withdraw across the Don River to the Donets River, where the high command planned a new defensive line.⁴³

This battalion arrived at the beginning of 1943 and Army Group Don immediately assigned it the mission of securing bridges across the Manytsch River for use by withdrawing forces.⁴⁴ By this time there was not a continuous front in the area. German forces defended a series of blocking positions and strong points in an attempt to stop the Soviet advance. These were located at key points at road or railroad junctions and major

river crossings.⁴⁵ The fighting was characterized by rearguard actions, while the main body of troops took up new positions farther back.

S.Pz.-Abt. 503 participated in this fighting from 1 January until 17 January 1943, primarily securing important river crossing sites (see figure 6). However, because of the fluid nature of the battlefield, they were sent from one important area to another and in one instance covered sixty-five kilometers in one day.⁴⁶

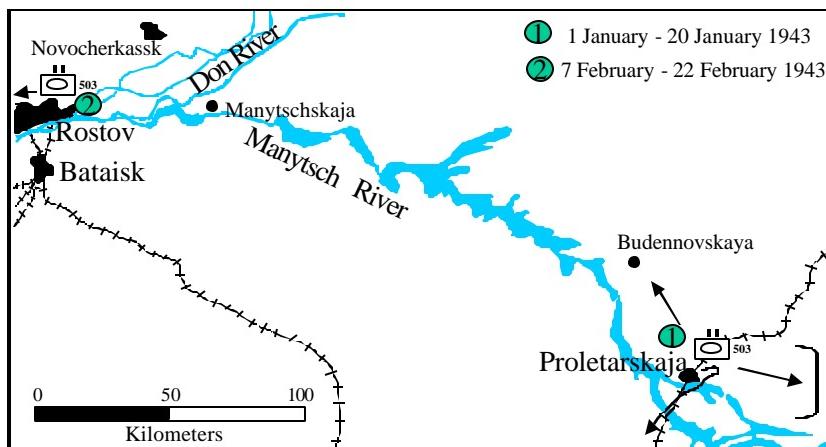


Fig. 6. S.Pz.-Abt. 503 with Army Group Don.

Probably the largest single employment of the battalion occurred on 7 January 1943 when the battalion, supported by 2d Battalion of Panzer Grenadier Regiment 128, attacked towards Stavropol. The 1st Company attacked frontally with the battalion of panzer grenadiers, while the 2d Company attacked from the left flank.⁴⁷ Altogether, the battalion fielded seventeen operational Tigers out of twenty and twenty Panzer IIIs out of thirty-one.⁴⁸ During the engagement, the Tigers knocked out eighteen Soviet tanks and destroyed an armored car and five antitank guns.⁴⁹ The enemy retreated and during the

pursuit the battalion lost its first vehicle during the entire engagement, a Panzer III to artillery fire.⁵⁰

Possibly the most important mission given this battalion was its attack to reduce a Soviet bridgehead at Wessley. The battalion fielded eleven operational Tigers and twelve Panzer IIIs and was again supported by the 2d Battalion of Panzer Grenadier Regiment 128 as well as by a battery of light howitzers.⁵¹ The attack began in the early morning of 9 January 1943. German forces made three attempts to achieve their objective during the day but the Soviets repulsed all attacks.⁵²

The battalion managed to destroy eight T-34s during the attack but also lost two Tigers and one Panzer III to enemy fire.⁵³ In addition, the nine other Tigers were so badly damaged that the battalion only had one operational Tiger at the end of the day. Two of these Tigers were sent back to Germany for general repairs.⁵⁴ In the space of six hours, one of these received 227 hits from antitank rifles and was struck 14 times by fifty-two-millimeter and 11 times by seventy-six-millimeter antitank rounds. It is a testament to the vehicle's durability that despite this damage, the Tiger still traveled back sixty kilometers under its own power.⁵⁵

On 14 January 1943, s.Pz.-Abt. 503 had the 2d Company of s.Pz.-Abt. 502, also in the region, attached to the battalion.⁵⁶ This became the only instance where three companies of the D organization were integrated under one battalion. However, because of losses to the battalion, this organization lasted only eight days and on 22 January 1943, the battalion disbanded the 2d Company.⁵⁷ The battalion integrated the remnants of this company into the 3d Company, and continued to operate with only two companies of the D organization.⁵⁸

After partially rebuilding its strength, Army Group Don assigned the battalion missions that involved securing the important railroad centers around Rostov (see figure 6). The battalion participated in many small local counterattacks that forced it to operate in company and platoon sized units. These elements operated with a wide variety of other units, usually in a subordinate role. In accomplishing these missions, the battalion demonstrated an incredible amount of flexibility in command and control and in company and platoon organizations, repeatedly changing command relationships and composition in order to accomplish the mission.

During this fighting, the battalion integrated Tigers and Panzer IIIs in many different ways. On two occasions the battalion formed a light company consisting of all Panzer IIIs and a heavy company with Tigers and the remainder of the Panzer IIIs. This light company primarily covered other units' withdrawal but did participate in an attack of 8 February 1943 in the northwest part of Rostov, where it destroyed twelve enemy tanks and three antitank guns.⁵⁹ The battalion commander employed this light company because of the difficult terrain, consisting of many ditches, across which the attacks were carried out.

From 19 February to 22 February 1943, the light company, starting with eight Panzer IIIs and two Tigers, conducted local counterattacks and occupied covering positions in the vicinity of Rostov. During this four day period, this company destroyed twenty-three T-34s and eleven antitank guns while losing one Tiger and one Panzer III.⁶⁰ After an engagement on 22 February 1943, the battalion only had two Tigers and five Panzer IIIs operational and withdrew to an area near Taganrog to refit.⁶¹ This battalion was not employed again until Operation CITADEL in July 1943.

During the almost two months of combat with Army Group Don, s.Pz.-Abt. 503 destroyed more than seventy-one enemy tanks and fifty-five antitank guns.⁶² In so doing, they lost around thirteen Panzer IIIs and had three Tigers knocked out due to enemy actions.⁶³ Another Tiger was destroyed, while waiting at the Budenny rail station for transport back to Germany for factory repair, when the battalion was forced to retreat to Rostov.⁶⁴ A total of four Tigers were so badly damaged in combat that they were transported back to Germany.⁶⁵ This means that this battalion destroyed 23.6 enemy tanks for the loss of each Tiger or 4.4 enemy tanks for the loss of any type tank, Panzer III and Tiger.

This battalion was much more effective than the units at Leningrad and in North Africa in recovering disabled Tigers. During combat that always involved retrograde movements, it destroyed only one Tiger to avoid capture. Additionally, this Tiger had already been recovered and loaded on a rail car for transport back to Germany. This battalion was very reluctant to destroy its own vehicles and did everything possible to recover Tigers. In one instance, three Tigers broke down in a withdrawal and instead of destroying them, the crews stayed with the vehicles until they could be recovered, which was over thirty hours later.⁶⁶ Diary entries are filled with examples of operational vehicles towing damaged vehicles back to the maintenance platoon to be repaired. In another instance, while the rest of the unit withdrew, six eighteen-ton recovery vehicles and two other Tigers recovered a Tiger that broke through the ice of a stream.⁶⁷

Despite the great efforts of the recovery elements, this battalion still suffered from a low operational readiness rate of its Tigers. On average, the battalion only maintained around 35 percent of its Tigers operational.⁶⁸ Probably one of the main reasons for

Tigers being in need of repair, was from damage due to enemy fire. Another reason may have been the great distances that it was tasked to cover. In one instance, the 2d company conducted a 107 kilometer roadmarch in ten and a half hours.⁶⁹ This unit did not lose any vehicles to maintenance breakdowns during the roadmarch, however, probably because the company commander ordered a maintenance halt every twenty kilometers.⁷⁰

Overall, this unit was very successful in its operations around Rostov. This unit played a large part in protecting the key road and rail networks that allowed the 1st Panzer Army to retreat. Some historians attribute preventing the Soviets in breaking through to Rostov and cutting the road and rail lines, to the actions of this battalion.⁷¹

Changes Before Operation CITADEL

A measure of the effectiveness of the heavy tank battalions fighting the Soviets can be ascertained by looking at the number of steps that the Soviets took in response to this threat. They did not have time to develop an armored vehicle to counter the Tiger before Operation CITADEL, but they did begin planning for vehicles such as the T-34/85 and the KV-85 heavy tank.

In the interim, the Soviets developed and fielded a heavy self-propelled gun, the SU-152, that was armed with a 152-millimeter gun designed to defeat the German heavy tanks.⁷² Additionally, the Soviets continued to field the SU-76 and the SU-122, which were armed with a 76-millimeter and a 122-millimeter gun respectively. All of these vehicles were grouped by type into SU regiments. By the time Operation CITADEL began, twenty-one SU regiments were at the front, mainly concentrated in the Kursk area, with three in reserve and seventeen still in training.⁷³

Also in response to the Tigers, the Soviets formed antitank battalions and assigned them to tank and mechanized corps. These were armed with an eighty-five-millimeter antiaircraft gun on a special mount with crews trained as antitank gunners. Many, although not all, of the tank and mechanized corps at Kursk had been reinforced with the eighty-five-millimeter antitank battalions prior to the German attack.⁷⁴

In terms of tanks, the Soviets formed heavy tank regiments to counter the threat of the German heavy tank battalions. Production of the KV-85, armed with an eighty-five-millimeter gun did not begin until August 1943, after the German offensive at Kursk.⁷⁵ So, the Soviets gathered all available KV1s and KV2s, armed with a 76- and a 152-millimeter gun, respectively, and formed five heavy tank regiments before the German offensive began.⁷⁶ None of the new tank regiments took part in the Battle of Kursk, but their availability was an indication of the concern to bolster the defense against the German Tigers and the heavy tank battalions.⁷⁷

The Russians realized that the Tiger had a powerful long-range eighty-eight-millimeter gun and thick frontal armor, making it superior to their tanks with seventy-six-millimeter guns. They believed that they could “only be fought effectively in close combat, where the T-34 could use its greater maneuverability and direct its fire at the sides of the heavy German tanks.”⁷⁸ This tactic resulted in the Soviet tanks “charging” at the German Tigers in an attempt to close the range as quickly as possible so the T-34/76 could have a chance of destroying the Tigers.

The Germans, for their part, were also busy reorganizing the heavy tank battalions into the E organizations, doing away with all the Panzer IIIs in the battalion. The fact

that the Germans deleted the Panzer IIIs from the organization is contrary to almost all of the recommendations in the available heavy tank battalion after action reports.⁷⁹

The sole exception to the call for Panzer IIIs in the after action reviews was a recommendation from the heavy company of the Panzer Grenadier Division *Grossdeutschland*. At this time, this unit fielded only a heavy company as part of the regiment, but was soon increased to an entire heavy tank battalion. This report stated:

The previous combat actions have shown that the Panzer III, originally intended to be a security vehicle for each Tiger, has not evolved to withstand hits from enemy weapons. The opponent's defensive weapons take it under fire in preference to firing at the Tiger. In addition, it would aid in improving the number of operational Panthers by having a pure company made up of only one type of Panzer. A very inefficient and complicated repair staff for the Tiger Company is necessary only because of transportation of Panzer III repair parts in addition to the difficulties with Tiger repair parts. In this case, it is appropriate to reduce Tiger units to only one type of Panzer – the *Panzerkampfwagen VI* (Tiger).⁸⁰

This report was probably more insightful, in retrospect, than the others that advocated retention of the Panzer IIIs. The majority of the recommendations argued for the continued inclusion of the Panzer IIIs so that they could accomplish missions other than those for which they were originally intended; scouting, liaison, evacuation of wounded, and resupply of Tigers. General Guderian, as Inspector of Armored Troops, rejected the majority of the recommendations that advocated continued inclusion of Panzer IIIs and argued for the concentration of Tigers in the E organization.⁸¹ He did, however, see the need for an improved scouting and liaison capability, and requested the creation of a reconnaissance platoon, mounted on armored half-tracks, that became part of the E battalion organization.⁸²

Another report from the Panzer Grenadier Division *Grossdeutschland* suggested incorporating a heavy tank platoon into every panzer battalion.⁸³ Others recommended incorporating a heavy tank company into the panzer regiment of every panzer division. Guderian rejected this, saying “dispersing them [Tigers] . . . is an idiotic squandering of this valuable equipment.”⁸⁴

The report by the heavy tank company of the Panzer Grenadier Division *Grossdeutschland* indicated that the unit was constantly employed as the lead element. This initiated responses from the Chief of the Army General Staff as well as from Guderian, that contradicted the established doctrine for the heavy tank battalions. The Panzer representative to the German Chief of the Army General Staff wrote:

Employing Tigers as the lead units is not self-evidently correct. Situations will occur where this is necessary or useful. The controlling factors are the tasks and the number of operational Tigers. If there are [only a few Tigers], their assignment to the point means that the Tigers will not be available when they are needed to attack enemy tanks. Losses will frequently occur due to mines and bridge failure, plus getting hung up in uncrossable terrain. In order to maintain the high operational and production value of the Tigers, it is necessary to concentrate the Tigers in units so that concentrated purposeful employment, maintenance, and care can be achieved.⁸⁵

This message was followed shortly by another from Guderian who took a similar position that seemed to argue against the use of the heavy tank battalion as the lead element in the attack. He wrote:

The Tiger unit is the most valuable and strongest weapon in a Panzer unit. If it is used as the point unit, it will quickly bring localized success because of its high combat power. However, they will have insufficient force at the start of a decisive battle that could mean destruction of the opponent in the depths of his position, because the Tigers will suffer heavy breakdowns due to mines, hits, and terrain obstacles. Therefore, they will enter the decisive phase of the battle already greatly depleted. Fundamentally, point units have increased fuel consumption. Because the Tiger already has a limited radius of action, when it is

used as a lead vehicle it will sometimes be short of fuel at the start of the decisive phase of the battle.⁸⁶

Despite these views, there is no record of any new doctrinal guidance being formally published. In any case, one aspect of the doctrine that clearly did not change was the emphasis upon concentration of the heavy tank battalion instead of dispersing it.

Operation CITADEL: The Battle of Kursk

Two heavy tank battalions participated in the Battle of Kursk. S.Pz.-Abt. 503 was still in southern Russia as part of Army Group South. It was attached to III Panzer Corps, part of Army Detachment Kempf, during Operation CITADEL as part of the southern pincer attack upon the Kursk salient.⁸⁷ The other heavy tank battalion involved in this operation was s.Pz.-Abt. 505, attached to Army Group Center.⁸⁸

Both of these battalions received orders to change from the D organization to the E organization in the Spring of 1943. S.Pz.-Abt 503 had completed this transition and fielded forty-five Tigers in three companies for the operation.⁸⁹ S.Pz.-Abt. 505 was still in the process of transitioning to the E organization during Operation CITADEL. They completed forming two E organization heavy tank companies, but the third company did not arrive until 8 July 1943, after the start of the offensive.⁹⁰ To compensate for this, (Wireless Radio) Company 312 was attached to it. This unit fielded remote controlled Borgward B IV vehicles, carrying 500 kilograms of TNT each, that were remotely maneuvered into position and then exploded to destroy antitank positions and other emplacements.⁹¹ This company's mission was to "conduct aggressive reconnaissance, detecting minefields and clearing lanes through them, destroying hard to overcome positions, such as fortified antitank weapons as well as super heavy tanks."⁹²

This battalion was also unique because of the way in which they used their Panzer IIIs that they had not yet turned in. They converted their Panzer IIIs into bridging material carriers by removing their turrets and placing planks, beams, and other bridging material on top.⁹³ Although the battalion was ordered to repair these vehicles, they had not repaired or turned them in prior to the start of the offensive.⁹⁴

These two heavy tank battalions involved in Operation CITADEL, even though similarly equipped, were employed differently. In the North, Army Group Center attached s.Pz.-Abt. 505 to the 6th Infantry Division of the XXXXVII Panzer Corps. This corps consisted of three panzer divisions and one infantry division, and was assigned as the main breakthrough force in the North.⁹⁵ In the south, Army Group South attached s.Pz.-Abt. 503 to the III Panzer Corps which also consisted of three panzer divisions and one infantry division. This corps was part of the larger ad hoc organization known as Army Detachment Kempf and initially had the mission of guarding the flank of II SS Panzer Corps from the adjacent 4th Panzer Army. It was also tasked with destroying enemy counterattack forces expected to arrive from the east and the north.⁹⁶ In spite of Guderian's guidance that Tigers be employed in a concentrated heavy tank battalion and against the strong advice of the battalion commander, the III Panzer Corps initially attached one heavy tank company to each of its panzer divisions (see figure 7).

The entire southern pincer of the German attack was well equipped with armored units, but had few infantry units. As such, this forced 4th Panzer Army and Army Detachment Kempf to adopt the tactic of using its tanks in the initial assault on the first day.⁹⁷ The area that the III Panzer Corps attacked was an absolutely level flood plain crisscrossed with small tributaries of the Northern Donets and Razumnoe Rivers that was

a good natural obstacle. The Soviets reinforced this with mines and other tank obstacles, severely restricting German armored units' mobility.⁹⁸

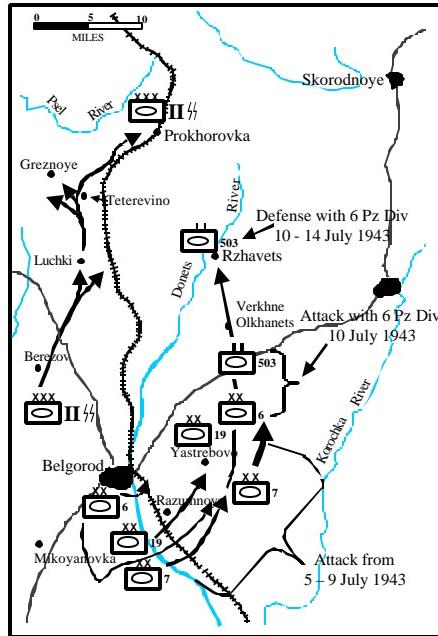


Fig. 7. S.Pz.-Abt. 503 -- Operation CITADEL.

Records concerning s.Pz.-Abt. 503 are filled with accounts of Tigers being halted by minefields, tank ditches, and streams and rivers. On the first day of the attack, the 2d Company had thirteen of its fourteen Tigers disabled by a minefield.⁹⁹ After attempting but failing to ford the Donets River at 2:30 A.M. on the first day of the attack, the 3d Company was finally able to cross early in the afternoon after the engineers built a bridge across it.¹⁰⁰ During the first three days of the attack, the heavy tank companies of the battalion supported the three Panzer divisions of III Panzer Corps. During this time, the corps managed to break through the first and second defensive lines but was only about

twenty kilometers from their start line, with another one hundred kilometers to go to reach Kursk.¹⁰¹

By 7 July 1943, the success of II SS Panzer Corps to the west had the primary attention of the Soviets. Tasked to protect the flank of II SS Panzer Corps, but still well to the south, this success presented a problem for III Panzer Corps. On 7 July 1943, III Panzer Corps consolidated s.Pz.-Abt. 503 and subordinated it to Panzer Regiment 11 of the 6th Panzer Division.¹⁰² The III Panzer Corps gave 6th Panzer Division the mission of spearheading the attack to link up with II SS Panzer Corps.¹⁰³ In order to complete this link up, the corps had to cross the Donets River again further upstream. Supported by s.Pz.-Abt. 503, 6th Panzer Division fought through Soviet defenses to Rzhavets across the Donets River, before being detached from III Panzer Corps (see figure 7).¹⁰⁴

S.Pz.-Abt. 503 destroyed approximately seventy-two Soviet tanks from the beginning of the offensive until the battalion was taken from III Panzer Corps on 14 July 1943.¹⁰⁵ During this time they lost four Tigers in combat and no Tigers had to be destroyed to avoid capture.¹⁰⁶ This was primarily due to the fact that the battalion was on the offensive and its maintenance and recovery elements could evacuate and repair damaged and disabled Tigers on the battlefield, instead of having to abandon them as in previous battles involving retreats. This meant that the battalion achieved a kill ratio of 18.0 to 1.

In a little over ten days of almost continual combat the battalion was able to maintain 57 percent of its Tigers operational, with the highest number available at one time being forty-two at the beginning of the operation and the lowest number being six, on 14 July 1943.¹⁰⁷

In the North, 9th Army had fewer tanks than the southern pincer attack and thus, its commander chose to attack primarily with infantry forces on the first day. The plan was for the infantry to breakthrough the Soviet defenses, allowing panzer units to exploit that breakthrough. The exception to this was the main effort in the north, the XXXXVII Panzer Corps. This corps attacked on the first day with the 20th Panzer Division and the 6th Infantry Division.¹⁰⁸ Attached to the 6th Infantry Division was s.Pz.-Abt. 505 (see figure 8).

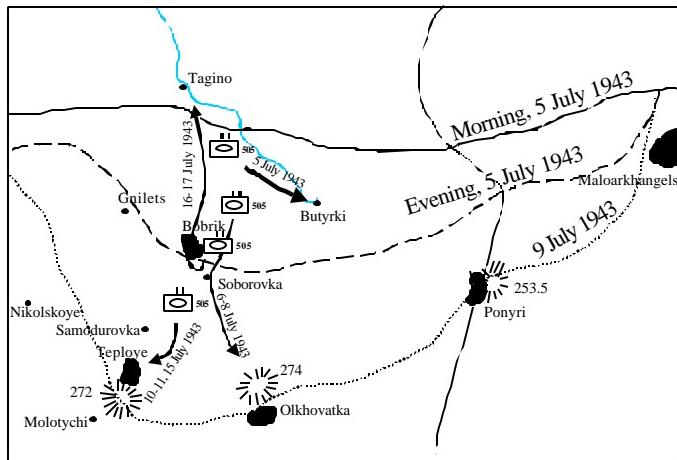


Fig. 8. S.Pz.-Abt. 505 -- Operation CITADEL.

On the first day of the attack, after crossing the river Oka and seizing the village of Novy-Chutor, the commander of the 6th Infantry Division ordered s.Pz.-Abt. 505 to attack at 9:30 A.M.¹⁰⁹ With its two companies and attached (Wireless Radio) Company 312, the battalion easily destroyed dug-in enemy tanks to their front and penetrated the defenses of the 15th Rifle Division's right flank. This battalion attack allowed German

forces to secure the important village of Butyrki and threatened the Soviet first echelon divisions with encirclement. S.Pz.-Abt. 505 had advanced farther and faster than Model had ever anticipated, but because the plan called for the commitment of the panzer divisions on the second day, these units were not in position to exploit the breakthrough. German accounts talk of a opportunity lost by not positioning armored forces to exploit the tactical breakthrough of the Soviet defenses by s.Pz.-Abt. 505. The division commander of the 6th Infantry Division stated:

We could observe movements by the Russians. If the tanks had rolled through then, we could perhaps have reached the objective of Kursk because the enemy was completely surprised and still weak. Valuable time was lost which the enemy used to rush in his reserves.¹¹⁰

The unit history of s.Pz.-Abt. 505 tells more of the potential opportunity lost:

5 July 1943: The penetrating assault of the battalion to Butyrki leads to the complete collapse of the Soviet 15th Infantry Division, causing a major crisis on the right wing of the 70th Army. The employment of the 2d Panzer Division at that time, not as scheduled on the following day, would have destroyed the whole front!¹¹¹

The success of the battalion's attack is re-emphasized by the fact that the Central Front commander, General Rokossovsky, quickly reinforced the 13th Army with 350 aircraft and control of the 13th and 1st Antitank Brigades, an artillery brigade, and the 21st Separate Mortar Brigade from the Central Front Reserve.¹¹² In an immediate attempt to stabilize the front, the 13th Army commander, General Pukhov, committed his reserve 27th Guards Tank Regiment and combat engineer units from all parts of the 13th Army.¹¹³

The next day, 6 July 1943, s.Pz.-Abt. 505 continued its attack, this time supporting the 2d and 9th Panzer Divisions.¹¹⁴ This attack caused the front and army

commander to commit further armored reserves in order to defeat the penetration of German forces and reestablish the first defensive belt.¹¹⁵ The Soviets committed the 16th Tank Corps consisting of two tank brigades.¹¹⁶ The lead tank brigade unexpectedly encountered s.Pz.-Abt. 505 and in a matter of a few minutes, the Germans destroyed forty-six of the brigade's fifty tanks.¹¹⁷ The supporting tank brigade was also heavily damaged, losing a further twenty-three tanks.¹¹⁸

For the next three days, the battalion continued to attack, along with the 2d and the 9th Panzer Divisions, in an attempt to secure the strategically important town of Ol'khovatka (see figure 8).¹¹⁹ In addition to determined resistance from Soviet infantry, the Soviets continued to commit their armored reserves into the battle and the Germans never took the town.

On 9 July 1943, 9th Army ordered s.Pz.-Abt. 505 to withdraw from the battle to act as corps reserve for XLVII Panzer Corps.¹²⁰ From 10 to 11 July 1943, s.Pz.-Abt. 505 supported attacks toward Toploye.¹²¹ The battalion transitioned to the defense and from 15 to 17 July 1943, it withdrew to its original start line.¹²²

The battalion was successful in destroying a large number of enemy tanks during their breakthrough attempt on the first day and were again successful in destroying a large group of enemy tanks during the Soviet counterattack on the second day. They were, however, unable to overcome the repeated counterattacks and the well established, deep Soviet defenses in order to assist in breaking through on an operational level.

S.Pz.-Abt. 505 destroyed forty-two Soviet tanks on the opening day of Operational CITADEL on 5 July 1943 and another sixty-seven the next day.¹²³ During fighting in the next few days, the attached (Wireless Radio) Company 312 destroyed an

additional T-34.¹²⁴ After the German offensive in the North stalled, the battalion assisted in repulsing Soviet armored counterattacks on 15 and 17 July 1943, destroying another twenty-two and thirty-two enemy tanks respectively.¹²⁵ During the period of employment when the Germans were on the offensive, s.Pz.-Abt. 505 destroyed a total of 110 enemy tanks, and a further 54 tanks when they transitioned to the defense.¹²⁶

During the same time, this unit lost a total of only five Tigers to enemy fire.¹²⁷ Three of these were lost during offensive operations and two were lost during defensive operations after 16 July 1943. As with s.Pz.-Abt. 503 in the south, this battalion was on the offensive and could more easily recover its damaged and broken vehicles. The result was that there were no Tigers destroyed by its own crew. Even though this battalion was unable to penetrate through the entire Soviet defenses and accomplish its mission, it was able to achieve a 36.6 to 1 kill ratio during offensive operations against an enemy that was in well prepared, deeply echeloned defenses and a 27 to 1 kill ratio when on the defensive.

This battalion suffered from a low operational rate during Operation CITADEL, maintaining an average of only 45.7 percent operational from 4 to 20 July 1943.¹²⁸ At the start of the battle it fielded twenty-six Tigers, but by the end of the second day of fighting, it only had six operational Tigers remaining.¹²⁹ After its 3d company arrived on 8 July 1943, the battalion fielded twenty-nine Tigers, the highest total that it was able to achieve throughout Operation CITADEL.¹³⁰

Unit diaries and other histories do not indicate exact numbers, but they make it clear that a major portion of the vehicles from both heavy tank battalions involved in Operation CITADEL were damaged from mines. This is very surprising considering that

both battalions were augmented or supported by additional engineer troops during some or all of the operation. Also, German sources do not mention it, but Soviet sources credit the Tiger tank with being mounted with a mine roller capable of detecting the forward edge of a minefield.

Under pressure of our powerful artillery fire, the Germans cleared mines and obstacles with the help of tanks, together with the work of sappers. For this purpose the enemy used Tiger tanks in front of which were attached 6 to 7 meter rods with a wooden roller set up on them. When the roller came up against a mine, the mine exploded, while the tank remained unharmed. In this manner the enemy easily detected the forward edge of the minefield, which was cleared with the help of sapper units.¹³¹

Regardless of whether these mine rollers were used or not, the heavy tank battalions did receive considerable damage from mines and when they encountered a minefield they were slowed or stopped until sappers could clear a path.

Summary

From the initial employment until the Battle of Kursk, the heavy tank battalions evolved from the D organization, that integrated Tigers with Panzer IIIs, to the Tiger pure E organization. This change was done based upon experience gained in combat in North Africa and throughout Russia and was made possible by the increased Tiger production. The inclusion of Panzer IIIs provided the heavy tank battalion with a high degree of flexibility in tailoring the force required to accomplish the missions given. However, the Panzer IIIs were not heavily armored enough to survive long in combat with a heavy tank battalion.

With a few notable exceptions, the heavy tank battalions were not employed according to the doctrine established for them, specifically, they violated the concept of concentration. Probably because of the tactical exigencies that existed wherever they

were deployed, they were not concentrated in a single force in accordance with their doctrine. At Kursk, when they were concentrated, they did not meet the high expectations throughout the German Army for these units, although they did achieve respectable results in terms of destroying enemy armor.

During this period, guidance for the employment of heavy tank battalions changed slightly based upon after action reports. Originally, doctrine advocated using the battalion as a point element. After evaluating several reports from heavy tank companies and battalions, Guderian and other influential leaders cautioned restraint in employing it in the lead in all cases. They felt that the unit would achieve initial results as the vanguard of the attack but might not be available to fight the decisive battle. This did not deter the leaders at Kursk from employing the heavy tank battalions as the leading units in the attack. Guderian's fears were realized during Operation CITADEL when both heavy tank battalions involved were reduced to low numbers of operational Tigers within a few days.

The Tiger proved to be an excellent tank that could withstand many large caliber hits and still continue its mission. The low number of Tigers destroyed by direct enemy action is proof of its resilience. It was, however, a very maintenance intensive vehicle. This forced heavy tank battalions on many occasions to operate with only a fraction of the vehicles authorized.

The low operational rate may have, paradoxically, contributed to the low number of Tigers destroyed in combat. Because there were only a few Tigers operational during the various campaigns, there were also only a few Tigers available to be destroyed in battle. However, the handful of vehicles operational proved many times, especially in the

defense, that they were capable of locally wreaking havoc on enemy armored units. The defense, a mission that the heavy tank battalions were not originally fielded for, became the primary focus of German units after the Battle of Kursk.

¹Peter Gudgin, *Armoured Firepower: The Development of Tank Armament, 1939-1945*, (Gloucestershire, England: Sutton Publishing, 1997), 90.

²Jentz, *Tiger I & II: Combat Tactics*, 24-26.

³Jentz, *Panzertruppen: 1943-1945*, 32.

⁴Schneider, *Tigers in Combat I*, 43, 83-85, 234.

⁵Ibid., 83-85.

⁶Ibid., 83-85.

⁷Kleine and Kuhn, *Tiger*, 13.

⁸Guderian, *Panzer Leader*, 280.

⁹“Armee-Oberkommando 18 Summary,” dated 2 April 1943, in *Tiger I & II: Combat Tactics*, Jentz, 40.

¹⁰Ibid., 39.

¹¹Ibid., 40.

¹²See Ibid., 41; Schneider, *Tigers in Combat I*, 84.

¹³Schneider, *Tigers in Combat I*, 83-85.

¹⁴Jentz, *Panzertruppen: 1943-1945*, 13.

¹⁵Schneider, *Tigers in Combat I*, 43.

¹⁶Gudgin, *The Tiger Tanks*, 107, 111.

¹⁷Schneider, *Tigers in Combat I*, 42.

¹⁸Ibid., 43.

¹⁹Ibid., 41-43.

²⁰See Ibid, 43; Jentz, *Tiger I & II: Combat Tactics*, 50, 55; Gudgin, *The Tiger Tanks*, 117. The battalion was authorized 20 Tigers in a two-company battalion and received two Tigers as replacements on 28 February 1943. Gudgin claims that the number is 20 operational Tigers, but this is highly unlikely as the battalion never had more than 20 Tigers at any one time.

²¹Jentz, *Tiger I & II: Combat Tactics*, 50.

²²Gudgin, *The Tiger Tanks*, 107, 104.

²³“Technische Report Nr. 3 von Truppen-Ingenieur Panzer-Abteilung 501, 18-25 Januar 1943,” in *Tiger I & II: Combat Tactics*, Jentz, 50.

²⁴“Technische Report Nr. 4 von Truppen-Ingenieur Panzer-Abteilung 501, 31 Januar – 1 Februar 1943,” in *Tiger I & II: Combat Tactics*, Jentz, 51.

²⁵See Schneider, *Tigers in Combat I*, 47; David Rolf, *The Bloody Road to Tunis* (London: Greenhill Books, 2001), 127-131; Paul M. Robinett, *Armor Command* (Washington, D.C.: McGregor & Werner, Inc., 1958), 163-164; Charles Whiting, *Kasserine: First Blood* (New York: Stein and Day, 1984), 173-191. German claims cannot be verified in every instance; however, they do not appear to be exaggerated in the cases where some level of verification is possible. For example, the Germans claim the destruction of 20 U.S. Sherman tanks on 14 February 1943 as part of Operation SPRING BREEZE. This is a reasonable number when considering the fact that a large portion of Combat Command A and almost all of Combat Command C of the U.S. 1st Armored Division was destroyed during the Battle of Kasserine Pass (Operation SPRING BREEZE). In two days the 1st A.D. lost 98 tanks, including 50 out of 54 in the 2d Battalion of the 1st Armored Regiment under LTC Alger.

²⁶Schneider, *Tigers in Combat I*, 43.

²⁷Ibid., 41-43.

²⁸Major Lueder, Commander of the 501st Heavy Tank Battalion, Letter dated 16 February 1943, in *Tiger I & II: Combat Tactics*, Jentz, 54.

²⁹Schneider, *Tigers in Combat I*, 43.

³⁰Jentz, *Tiger I & II: Combat Tactics*, 56.

³¹Lueder, “Combat Report, dated 16 December 1942,” in *Tiger I & II: Combat Tactics*, Jentz, 43.

³²Ibid., 45.

³³Lueder, “Combat Report for the Period from 18 to 22 January 1943,” dated 27 January 1943, in *Tiger I & II: Combat Tactics*, Jentz, 48.

³⁴Schneider, *Tigers in Combat I*, 233-234.

³⁵Ibid., 233. German sources credit s.Pz.-Abt. 504 with the destruction of 35 US tanks. US sources universally mention that this attack was halted, although rain and swampy conditions are usually given as the primary factors, while no losses are provided.

³⁶See Schneider, *Tigers in Combat I*, 233-234; Jack Coggins, *The Campaign for North Africa*. (New York: Doubleday and Company, 1980), 137, 155-157. This attack was part of the Allied offensive called Operation VULCAN. British losses within the 1st and 6th Armored Divisions on 21 April 1943 were 162 tanks. S.Pz.-Abt. 504 claims to have destroyed approximately 40 British tanks on this day. Although they claim these tanks belonged to the 9th (UK) A.D., only the 1st and 6th A.D.s attacked in the Medjez el Bab area on this day.

³⁷Jentz, *Tiger I & II: Combat Tactics*, 60.

³⁸Schneider, *Tigers in Combat I*, 234.

³⁹Restayn, *Tiger I on the Western Front*, 44.

⁴⁰“Technischer Report Nr. 6 von Truppen-Ingenieur Panzer-Abteilung 501, 3 März-1 Mai 1943,” in *Tiger I & II: Combat Tactics*, Jentz, 62.

⁴¹Ibid.

⁴²Dana V. Sadarananda, *Beyond Stalingrad: Manstein and the Operations of Army Group Don* (New York: Praeger Publishers, 1990), 56.

⁴³Ibid., x, 60-61.

⁴⁴Schneider, *Tigers in Combat I*, 153.

⁴⁵Sadarananda, *Beyond Stalingrad*, 61.

⁴⁶Lange, Commander of 2/s.Pz.-Abt. 502. “After Action Report, 29 January 1943,” in *The Combat History of Schwere Panzer Abteilung 503*, 56.

⁴⁷Schneider, *Tigers in Combat I*, 153.

⁴⁸Ibid.

⁴⁹Kleine and Kuhn, *Tiger*, 48.

⁵⁰Ibid.

⁵¹Ibid.

⁵²Ibid.

⁵³Schneider, *Tigers in Combat I*, 153.

⁵⁴Kleine and Kuhn, *Tiger*, 52.

⁵⁵Ibid.

⁵⁶Schneider, *Tigers in Combat I*, 154.

⁵⁷Ibid.

⁵⁸Ibid.

⁵⁹Ibid.

⁶⁰Ibid., 155.

⁶¹Ibid.

⁶²Ibid., 153-155.

⁶³Ibid.

⁶⁴Ibid., 154, 226.

⁶⁵Ibid., 226.

⁶⁶Richard Freiherr von Rosen, “Initial Employment with Heeresgruppe Don,” in *The Combat History of Schwere Panzer-Abteilung 503*, 44.

⁶⁷Ibid.

⁶⁸Jentz, *Tiger I & II: Combat Tactics*, 68.

⁶⁹von Rosen, “Initial Employment with Heeresgruppe Don,” in *The Combat History of Schwere Panzer-Abteilung 503*, 43.

⁷⁰Kleine and Kuhn, *Tiger*, 52.

⁷¹Williamson Murray and Allan R. Millett, *A War To Be Won: Fighting the Second World War* (London: The Belknap Press of Harvard University Press, 2000), 292.

⁷²See David M. Glantz and Jonathan M. House, *The Battle of Kursk* (Lawrence, Kansas: University of Kansas Press, 1999), 19; Walter S. Dunn, Jr., *Kursk: Hitler's Gamble, 1943* (London: Praeger Publishers, 1997), 30.

⁷³Ibid., 31.

⁷⁴Dunn, *Kursk: Hitler's Gamble, 1943*, 28.

⁷⁵Ibid., 91.

⁷⁶Ibid., 91-92.

⁷⁷Ibid., 92.

⁷⁸Pavel Rotmistrov, "Tanks Against Tanks," in *Main Front: Soviet Leaders Look Back on World War II*, with a foreword by Marshal of the Soviet Union S. Sokolov and a Commentary by Professor John Erickson (New York: Brassey's Defence Publishers, 1987), 110.

⁷⁹See Lueder, "Letter dated 16 February 1943," "Tiger Experiences in Tunisia, dated 18 March 1943," and "Schwere Panzer Abteilung 503 Combat Report for the Period 2 to 22 February 1943," in *Tiger I & II: Combat Tactics*, Jentz, 54-55, 59, 65; Captain Lange, "After Action Report of the 2/schwere Panzer-Abteilung 502, dated 29 January 1943," in *The Combat History of Schweren Panzer Abteilung 503*, 57-58.

⁸⁰"The 13.(Tiger) Company/Panzer-Regiment Grossdeutschland After Action Report on Employment from 7 – 19 March 1943 in the area of Poltawa-Belgorad," *Tiger I & II: Combat Tactics*, Jentz, 75.

⁸¹Guderian, Generalinspekteur der Panzertruppen, 14 May 1943, quoted in *Tiger I & II: Combat Tactics*, Jentz, 79.

⁸²Ibid.

⁸³"Infanterie-Division 'Grossdeutschland' Report, Dated 3 April 1943" in *Tiger I & II: Combat Tactics*, Jentz, 74.

⁸⁴Guderian, Generalinspekteur der Panzertruppen, 27 April 1943, quoted in *Tiger I & II: Combat Tactics*, Jentz, 74.

⁸⁵Panzer officer on the Staff of the Chief of the Army General Staff, "Comments on the reports from the Tiger Company of Infantry Division 'Grossdeutschland', Dated 11 April 1943" in *Tiger I & II: Combat Tactics*, Jentz, 77.

⁸⁶Guderian, “Comments of the Experience Report from the 13. Company (Tiger)/Panzer-Regiment ‘Grossdeutschland’, Dated 14 May 1943” in *Tiger I & II: Combat Tactics*, Jentz, 79.

⁸⁷Niklas Zetterling and Anders Frankson, *Kursk 1943: A Statistical Analysis* (London: Frank Cass Publishers, 2000), 134.

⁸⁸Jentz, *Panzertruppen: 1943-1945*, 74.

⁸⁹Schneider, *Tigers in Combat I*, 156.

⁹⁰Jentz, *Tiger I & II: Combat Tactics*, 85.

⁹¹See Schneider, *Tigers in Combat I*, 267-268; Restayn, *Tiger I on the Western Front*, 138.

⁹²Karlheinz Munch, *Combat History of Schwere Panzerjager Abteilung 653, formerly the Sturmgeschutz Abteilung 197: 1940-1943*, trans. Bo H. Friesen. (Winnipeg, Manitoba: J.J. Fedorowicz Publishing, 1997), 51.

⁹³Jentz, *Tiger I & II: Combat Tactics*, 85-86.

⁹⁴Schneider, *Tigers in Combat I*, 268.

⁹⁵Dunn, *Kursk: Hitler’s Gamble, 1943*, 55-56.

⁹⁶Hermann Breith, General der Panzertruppen, Commander of III Panzerkorps, *Breakthrough of a Panzer Corps Through Deeply Echeloned Russian Defenses During Battle of Kharkov [Kursk], July 1943*. MS # D-258, Draft Translation (Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1947), 2.

⁹⁷Dunn, *Kursk: Hitler’s Gamble, 1943*, 109.

⁹⁸Glantz and House, *The Battle of Kursk*, 104.

⁹⁹Graf Kageneck, Hauptmann, Commander of s.Pz.-Abt. 503 “Daily Report, dated 6 July 1943,” in *Panzertruppen: 1933-1942*, Jentz, 92-93.

¹⁰⁰von Rosen, “Zitadelle,” in *The Combat History of Schwere Panzer-Abteilung 503*, 107-108.

¹⁰¹Dunn, *Kursk: Hitler’s Gamble, 1943*, 137.

¹⁰²Jentz, *Panzertruppen: 1933-1942*, 87-91.

¹⁰³Glantz and House, *The Battle of Kursk*, 136.

¹⁰⁴von Rosen, “Zitadelle,” in *The Combat History of Schwere Panzer-Abteilung 503*, 108-109.

¹⁰⁵See Schneider, *Tigers in Combat I*, 156-157; Breith, *Breakthrough of a Panzer Corps*, MS # D-258, 11.

¹⁰⁶Schneider, *Tigers in Combat I*, 226.

¹⁰⁷Jentz, *Tiger I & II: Combat Tactics*, 90.

¹⁰⁸Glantz and House, *The Battle of Kursk*, 86.

¹⁰⁹Robin Cross, *Citadel: The Battle of Kursk* (New York: Sarpedon, 1993), 163.

¹¹⁰Ibid. This is an overly optimistic assessment of the situation given that the Soviets had not committed any Operational or Strategic reserves at this point in the battle.

¹¹¹Schneider, *Tigers in Combat I*, 268. It is unclear whether the author used the word “front” in this statement to mean an echelon of the Soviet defenses or the Soviet Central Front, which was similar in size to a German Army Group. If the former, destruction of an echelon of the tactical defense was probably possible. If the latter, destruction of the entire Central Front by the commitment of one panzer division is a very optimistic and probably unrealistic assessment. Although the Central Front commander obviously saw penetration of the first defensive echelon as a threat, the Central Front stabilized the situation with operational reserves and did not require reinforcement from any strategic reserves at any time during the battle.

¹¹²Glantz and House, *The Battle of Kursk*, 89.

¹¹³Ibid.

¹¹⁴Ibid., 93.

¹¹⁵Ibid., 91.

¹¹⁶David M. Glantz and Harold S. Orenstein, eds., *The Battle for Kursk, 1943: The Soviet General Staff Study* (London: Frank Cass Publishers, 1999), 114.

¹¹⁷See Ibid; Glantz and House, *The Battle of Kursk*, 93.

¹¹⁸Glantz and House, *The Battle of Kursk*, 93.

¹¹⁹Ibid., 117.

¹²⁰Schneider, *Tigers in Combat I*, 268.

¹²¹Ibid.

¹²²Ibid.

¹²³See Ibid., 267-268; Glantz and House, *The Battle of Kursk*, 18.

¹²⁴Schneider, *Tigers in Combat I*, 268.

¹²⁵Ibid.

¹²⁶Ibid.

¹²⁷Ibid., 311.

¹²⁸Jentz, *Tiger I & II: Combat Tactics*, 90.

¹²⁹Ibid.

¹³⁰Ibid.

¹³¹Glantz and Orenstein, eds., *Kursk Soviet General Staff Study*, 71.

CHAPTER 4

AFTER OPERATION CITADEL TO THE END OF THE WAR

The employment of “Tigers” in individual groups (spread over the corps sector and frequently shifted from one division to another) succeeded for the most part in keeping the main battle line of the corps intact. Wherever “Tigers” were employed, the Russians called off their attacks or only repeated them with infantry in suitable terrain (woods and the area around lakes).¹

Major Hans-Joachim Schwaner, Commander of s.Pz.-Abt. 502

Tiger production greatly increased after the Battle of Kursk. By the end of the war, Germany fielded nine more heavy tank battalions, in addition to reconstituting three of the first five that had been destroyed. The German High Command committed these units in all of the major battles and campaigns through the rest of the war, with heavy tank battalions moving from one priority area to the next. Even though the German forces were on the defensive throughout this two year period, the doctrine for the employment of the heavy tank battalions did not change to reflect this new, primarily defensive role.

Fighting on the Russian Front

The failed German offensive at Kursk was followed by a series of Soviet counter-offensives that pushed the Germans back 150 miles across a front of 650 miles.² In addition to the two heavy tank battalions that participated in Operation CITADEL, OKH committed four more heavy tank battalions to Army Groups Center and South by the end of 1943 in an attempt to stop the Soviet offensives.³ Because the focus for the Soviets was in the south, three heavy tank battalions joined s.Pz.-Abt. 503 in Army Group South’s sector. These three battalions were the 3d Battalion of Panzer Regiment

Grossdeutschland and s.Pz.-Abt. 506 and 509, and they arrived on the Eastern Front in August, September, and November, respectively.⁴

All of the battalions that took part in the retreat in the latter half of 1943 encountered many difficult situations. These heavy tank battalions defended across extended frontages, often without any infantry support. They also had to overcome obstacles such as recovery of damaged and broken vehicles during retrograde operations involving river crossings. Another common experience among these battalions was that of piecemeal employment as elements of the battalions arrived at the front at different times.⁵

The most extensive and candid after action review by a unit during this time came from s.Pz.-Abt. 506's battalion commander, Major Withing. It exhaustively detailed the losses that the Tigers suffered and the transportation problems encountered, as well as the problems of maintenance, command and control, and coordination with supporting units, especially infantry. The problems this battalion encountered are probably indicative of the problems encountered by all of the heavy tank battalions with Army Groups South and Center at this time.

During its deployment in September 1943, it took four days for the trains carrying the battalion's vehicles and equipment to arrive and be downloaded at a single station.⁶ It was attached to the 9th Panzer Division of the XXXX Panzer Corps whose mission was to contain the Soviets in the Saporoshje bridgehead by defeating any penetration of the defensive line. Whiting's report was very critical of the supporting infantry, and placed the blame for their performance on low morale of infantry from the long retreats and on the low quality of training.

The battalion was in continuous combat from the moment they arrived at the front and because of the repeated Russian attacks, XXXX Panzer Corps transferred them back and forth across the front to the most threatened sectors. This did not allow much time for maintenance of the Tigers and their report states that they barely had time to refuel and load available ammunition between engagements.⁷

This type of employment, without proper maintenance periods, caused extreme difficulties, and within seven days the battalion was reduced from forty-five new, operational Tigers to zero ready for combat.⁸ Only six of these Tigers were totally destroyed, all from direct hits in combat. The unit after action report, however, contained a complete accounting of the damage to the other Tigers of the battalion. This report made it clear that there were many other Tigers that were very badly damaged from combat.

An interesting aspect of the damages is the fact that even small deficiencies like the destruction of the driver's vision block severely degraded the Tiger's operation. Because the Soviets found it difficult to penetrate the Tiger, the battalion commander wrote that "the Russians fired all of their weapons at the running gear, gun, and vision slits."⁹ This effectively immobilized a large number of Tigers or rendered them combat ineffective. Another deficiency on many Tigers was the failure of the vehicle's internal communication system. The report stated that "the driver could no longer be directed by the commander, which made command extraordinarily difficult because the Tiger had to halt and the engine switched off each time the commander needed to redirect the driver."¹⁰

Whithing made it clear in his report that he believed that the battalion was not being employed correctly. He complained that other units and his higher headquarters had such high expectations for his unit, that the battalion was given impossible missions, without proper support from the other branches of the army. A common theme throughout this report is that this battalion was a victim of the propaganda concerning the Tiger tank. The battalion commander wrote:

The extensive propaganda in the newspapers touts the Tiger as being invulnerable and pure life insurance, so the higher command as well as the simple infantry soldier believes that they can continuously accomplish everything with this fortress.¹¹

Major Withing was killed in action less than a month after he wrote the report but his successor was equally critical of the employment of the s.Pz.-Abt. 506.¹² After many difficult months of continual employment across wide frontages, usually in the foremost defensive positions and often with little or no infantry support, the battalion commander sought to clarify the doctrinal role of his battalion. He wrote:

Our understanding still remains the same as a year ago, that the Tiger is a battering ram in the attack and a bumpstop to be used as the *Schwerpunkt* [decisive point] on defense. It is to stand ready in sufficient numbers for the higher command to use at the decisive moment. However, this can occur only if, in between the main battles, time is given for care and maintenance instead of being continuously employed as mobile bunkers.¹³

His real criticism was on the performance of the infantry whom he stated lacked the training and morale to remain in defensive positions without the direct support of Tigers. As a positive example, he cited the conduct of the Panzer Grenadiers of the 13th Panzer Division as exemplary because they remained alone in their forward positions, allowing tanks to consolidate and counterattack from assembly areas in the rear. In other units he

stated, “as soon as the Panzers pull back, the infantry immediately follow, as if drawn magnetically.”¹⁴

Encirclement: The Cherkassy Pocket

On 3 January 1944 s.Pz.-Abt. 503 received a full battalion complement of forty-five new Tiger tanks.¹⁵ In addition to the remaining twenty-four Tigers of the battalion, these new tanks brought the battalion’s strength to sixty-nine Tigers.¹⁶ The replacement vehicles arrived just in time to take part in the fighting around Cherkassy.

On 11 January 1944, the III Panzer Corps incorporated thirty-four Tigers of s.Pz.-Abt. 503 with the 2d Battalion of Panzer Regiment 23 and several support units to form Heavy Panzer Regiment Bake, named for its commander, Lieutenant Colonel Bake.¹⁷ This unit’s mission was to relieve pressure on the two German corps defending further east, at Cherkassy, by attacking north into the encircling Soviet formations around Medwin.¹⁸

This improvised battle group began its attack at 6:00 A.M. on 24 January 1944 towards Oratoff.¹⁹ Over the next five days of fluid fighting, this unit destroyed 267 enemy tanks while losing only one Tiger and three Panthers.²⁰ Furthermore, the Tiger was reportedly destroyed by a Panther and not from enemy fire.²¹

After the Soviets completed the encirclement of German forces in Cherkassy on 28 January 1944, the III Panzer Corps pulled Heavy Panzer Regiment Bake out of contact in order to prepare for the attack to relieve the encircled German forces. S.Pz.-Abt. 503 spearheaded the attack of Heavy Panzer Regiment Bake and this unit, in turn, was the lead unit for the III Panzer Corps.²²

The attack began on 11 February 1944 and continued until 16 February 1944 when elements inside the pocket began their breakout (see figure 9). By 17 February 1944 when German forces linked up, Heavy Panzer Regiment Bake only had eight operational Tigers and six Panthers.²³ Other German units relieved it on 19 February 1944 and Heavy Panzer Regiment Bake disbanded on 25 February 1944.²⁴

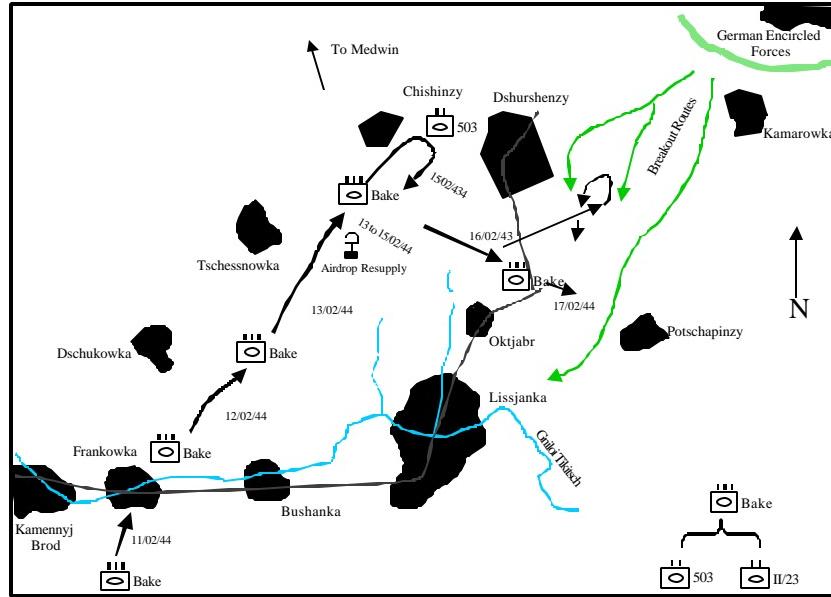


Fig. 9. Heavy Tank Regiment Bake -- Cherkassy.

Reports do not differentiate between the tank kills of s.Pz.-Abt. 503 and of the Panthers of II./23 Panzer Regiment. These two battalions of Heavy Panzer Regiment Bake are credited with the destruction of 329 Soviet tanks during almost two months of fighting around Cherkassy.²⁵ During that time, s.Pz.-Abt. 503 lost twenty-two Tigers, six of which were destroyed by their own crews because of failed recovery attempts.

Because the number of enemy tank kills cannot be directly attributed to s.Pz.-Abt. 503, an accurate kill ratio comparison cannot be made. Even though the battalion was unable to break through the encirclement, they did penetrate far enough to allow other German forces to link up with the encircled forces. As the lead unit throughout the majority of the operation, their participation must be viewed as successful. Also, attributing even a conservative number of the 329 Soviet tank kills to the battalion establishes this as a very successful operation.²⁶ The low number of Tigers destroyed by their own crew is also a positive statement for the battalion, although it was attacking most of the time, making it easier to recover damaged and disabled vehicles.

Italy

The employment of the heavy tank battalions in Italy highlighted the deficiencies of the heavy tank battalions in recovery vehicles and in the high maintenance requirements of the Tiger tanks. Two heavy tank battalions, s.Pz.-Abt. 508 and 504, saw action in Italy. The first to be committed, s.Pz.-Abt. 508, arrived at the Anzio front in the middle of February 1944.²⁷ Army Group C committed this battalion in various spots in Italy for the next year until they turned over their remaining fifteen Tigers to s.Pz.-Abt. 504 on 12 February 1945.²⁸ That battalion was first employed in Italy on 20 June 1944 and surrendered to American and British forces in Italy at the end of the war without any operational tanks.²⁹

After the Allied landings at Anzio on 22 January 1944, OKH ordered s.Pz.-Abt. 508 to assist in eliminating the beachhead.³⁰ Because of Allied air superiority and other problems in transportation, the battalion was unloaded at a railhead 200 kilometers from its destination of Anzio. The Tiger's mechanical deficiencies were highlighted during

this roadmarch, and about 60 percent of the Tigers broke down due to problems in negotiating the narrow, sharply twisting mountain roads.³¹ One Tiger even caught fire and exploded.³² Instead of a single powerful force of forty-five Tigers, the battalion arrived at the Anzio front piecemeal.³³

The battalion's first attack was on 16 February 1944, but because of the swampy terrain, the Tigers were forced to stay on the few roads in the area, and they did not achieve their objective (see figure 10).³⁴ This battalion participated in several other unsuccessful attacks that attempted to reduce the Allied bridgehead. It also helped to contain the bridgehead, destroying three Shermans that had penetrated the front lines on 21 February 1944 and another seventeen U.S. tanks on 24 February 1944.³⁵

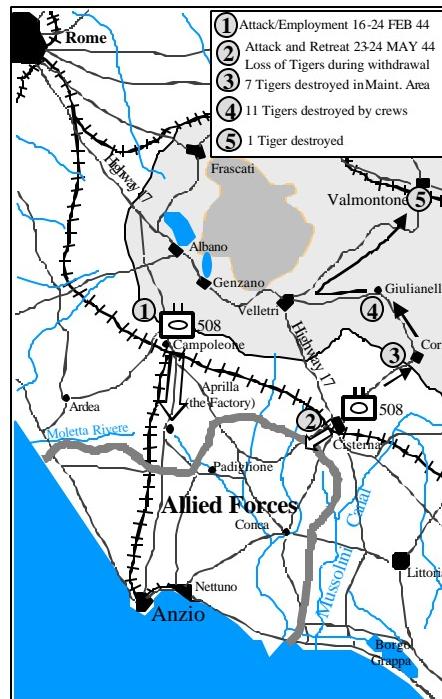


Fig. 10. S.Pz.-Abt. 508 at Anzio.

The German forces launched their last attempt to eliminate the bridgehead on 29 February 1944. It was doomed to failure because of the restrictive terrain that forced the battalion to attack along three main roads. This attack suffered losses from an overwhelming and accurate barrage of naval gunfire and from well placed mines. Altogether, eight tanks were damaged during this attack from mines, artillery and from antitank fire.³⁶ During the next five days, the battalion recovered all of the disabled Tigers, but four were so badly damaged that they couldn't be repaired. Because all of the disabled Tigers were under direct observation from Allied forces and recovery vehicles lacked armor protection, only Tigers were used to tow the disabled vehicles.³⁷

After a short time in Rome, where the battalion consolidated and prepared for further combat operations, it was employed along the front in small groups, down to individual tanks. Although it is not clear why, on 11 April 1944, the unit's log recorded an entry that became familiar with Tiger units in Italy; "several tanks are employed in an artillery role."³⁸ The last accomplishment before the battalion went through a long series of losses was an attack across the Cisterna-Littoria railway embankment on 23 May 1944 in which fifteen Shermans were destroyed (see figure 10).

The 3d Company experienced the majority of the trouble, and its problems are indicative of the problems experienced by the entire battalion. According to a German report shortly after the attack, three Tigers broke down crossing the line of departure, a railway embankment. The Allies fell back around three kilometers and several U.S. tanks were destroyed. One Tiger was damaged when an artillery round destroyed its radiator, forcing it to limp back to the battalion assembly area in Cori. On the morning of 24 May 1944, Army Group C ordered a retreat because the Allies had managed to break through

between Cisterna and the Mussolini Canal.³⁹ Because of maintenance breakdowns and recovery problems during the withdrawal, the company destroyed every Tiger except one.⁴⁰

During the three day period from 23 May to 25 May 1944, s.Pz.-Abt. 508 lost twenty-two Tigers.⁴¹ Every one of these was destroyed by its own crews and only a handful were damaged in combat prior to their destruction. Of those damaged in combat, none were damaged beyond repair, but because they were under enemy fire and recovery was impossible, the crews were forced to destroy them.

On 25 May 1944, the battalion commander reported to Hitler's Headquarters, as ordered.⁴² Because the battalion's losses were considered so high, the battalion commander was fired that evening, presumably on Hitler's orders.⁴³ However, because the battalion lacked a suitable recover vehicle and the Tiger had a tendency to break down in hilly, rugged terrain, the battalion commander's performance cannot be the sole reason, if he can be blamed at all, for the high Tiger losses.

Immediately following the German retreat, the Allies conducted a study of the destroyed Tigers in this area to "find out what weapon or what tactics had been responsible, so that the dose might be repeated on other occasions."⁴⁴ This report concluded that:

The Tiger is not yet sufficiently developed to be considered a reliable vehicle for long marches. He suffers from frequent suspension defects and probably also gearbox trouble. When pushed, as in a retreat, these troubles are too frequent and serious for the German maintenance and recovery organization to deal with.⁴⁵

This assessment was very astute, in that, what was extremely difficult to overcome tactically or frontally, could be overcome rather easily operationally and strategically by forcing the heavy tank battalions to move over long distances in a short amount of time.

This great loss of Tigers was repeated on a smaller scale two weeks later during the battalion's withdrawal north of Rome. During this withdrawal, another thirteen Tigers were lost on 13 June 1944, and again, most were from self-destruction.⁴⁶

This battalion was not alone in its problems of maintenance and recovery of Tigers. S.Pz.-Abt. 504 was first employed in Italy on 20 June 1944, during a time when the Germans were withdrawing north because the Gustav Line had been breached.⁴⁷ During a ten day period, from 22 June to 1 July 1944, this battalion lost twenty-eight of its forty-five Tigers.⁴⁸ Of these twenty-eight, it is likely that only one was knocked out and totally destroyed in direct combat. Others broke down during roadmarches, broke through bridges, or slid off the sides of roads. Only a couple were reported as having been slightly disabled in direct combat and were unable to be recovered, forcing their crews to destroy them.

During the British 8th Army's offensive in September 1944, the battalion lost a further eleven Tigers during its retreat to the Gothic Line, all were destroyed by their own crews to avoid capture.⁴⁹ Although not specifically mentioned, it appears that the Germans attempted to overcome the Tiger's mechanical weaknesses in the Italian campaign by employing it primarily on good roads. During the fighting along the Gothic Line, the battalion was employed mainly along Route 9, between Bologna and Cesena.⁵⁰

During the majority of these two battalion's employment in Italy, they were not employed as a battalion, or even as companies and platoons. In order to provide tank

killing coverage along the entire front, they were widely dispersed, often using single tanks.⁵¹ This violated the principle of concentration that the Germans called for in the employment of their armor. It also caused extraordinary problems for command and control and for logistics for the battalion.

Log entries in the unit histories indicate that this was a misuse of the battalion. It may have been a misuse of the battalion based on its original purpose, but given the situation in terms of mission and terrain, the employment in Italy was probably more effective than concentrating the unit at a single point. Small groups and even single Tigers proved they were capable of defending against heavy enemy attacks, especially in restrictive terrain. Given the mechanical difficulties of the Tiger, getting to a good defensive location seems to have been more than half the battle. If the Germans had concentrated these battalions along a single sector of the front, the Allies would have found it easier to break through in another sector and a repeat of the major losses during withdrawals may have occurred, which is exactly the strategy that the Allies wished to employ against these powerful formations.

The heavy tank battalions were not as successful in Italy at destroying enemy tanks as they were elsewhere. S.Pz.-Abt. 508 lost seventy Tigers in Italy and only managed to destroy a little more than one hundred enemy tanks.⁵² This gives this battalion a kill ratio of only 1.43 to 1. Of the seventy Tigers lost, however, almost fifty were destroyed by their own crews to avoid being captured.⁵³ Thus, the kill ratio of direct combat losses was 3.3 enemy tanks for every Tiger destroyed in combat.

S.Pz.-Abt. 504 lost eighty-seven Tigers during its employment in Italy and destroyed one hundred enemy tanks during that time.⁵⁴ Of the eighty-seven Tigers, only

thirteen were destroyed by enemy fire.⁵⁵ Of the seventy-four Tigers that were destroyed by their own crews, twenty-nine of these were destroyed during the final month of the war when the strategic situation was hopeless for the Germans.⁵⁶ Until the final month of the war then, this battalion destroyed 7.7 enemy tanks to every Tiger lost in direct combat and almost two enemy tanks for every Tiger lost, regardless of the reason.

With the exception of the withdrawals where large numbers of Tigers broke down, these two battalions were able to maintain a fairly high operational rate for their vehicles. S.Pz.-Abt. 508 was able to maintain a 60 percent operational rate for their Tigers while s.Pz.-Abt. 504 maintained almost an 82 percent operational rate for theirs.⁵⁷ Notably, this was achieved despite being so widely dispersed across the front. Of course, once in place, these vehicles also were not required to conduct long roadmarches from one spot to another, which helped to reduce the number of breakdowns. Also, the Italian theater was primarily static, with German forces defending prepared lines. Undoubtedly, this static nature was also a factor in raising the maintenance status of the battalions.

The Last Year of the War

By the end of May 1944, the Germans had built up an impressive number of heavy tank battalions to counter the expected Soviet summer offensive in the east and the Allied invasion of France. Six independent heavy tank battalions and the *Grossdeutschland*'s heavy tank battalion were on the Eastern front preparing for the inevitable Soviet attack.⁵⁸ In the west, the Germans positioned s.SS-Pz.-Abt. 101 and 102 (later 501 and 502) in Belgium and the Netherlands respectively, prepared to react to any invasion of France.⁵⁹ In addition to the two heavy tank battalions operating in Italy, s.Pz.-Abt. 503 was reestablished after its near destruction in the east and fully re-

equipped with forty-five new Tigers by 17 June 1944. OKH also formed its last new heavy tank battalion, s.Pz.-Abt. 510, which was fully manned and equipped by 20 July 1944.⁶⁰

This period marked a high point in the number of heavy tank battalions available and in the strength of the battalions overall. The Allied offensives known as Operation OVERLORD in the west and Operation BAGRATION in the east led to heavy losses in heavy tank battalions. By the end of July, three heavy tank battalions, s.Pz.-Abt. 501, 505, and 506, were decimated in the east. These battalions either had no tanks left, or had so few that they handed them over to other heavy tank battalions. In some instances, the few remaining tanks were so badly damaged that they were transported back to factories in Germany to be overhauled.⁶¹ In the West, of the three heavy tank battalions committed to Normandy, only a handful of Tigers made it across the Seine River, and probably none of these made it all the way back to Germany, although one managed to make it to Brussels.⁶²

By the last year of the war, the heavy tank battalions encountered more weapons capable of penetrating the Tiger and the Tiger II. Tiger crews were so confident in their vehicle that they did not adhere to the same tactics that more lightly armored tanks did. This was beginning to cause losses from a general lack of care in adhering to such basic tactical principles as overwatch, use of terrain, and proper reconnaissance. To counter this the Inspector of Panzer Troops wrote an article, stressing the importance of Tiger's adherence to accepted tactical principles.⁶³

The Allied offensives forced the German military and the heavy tank battalions to operate primarily on the defensive, although heavy tank battalions did participate in some

offensives during the last year of the war. However, an examination of the last year's major operations reveals that Tigers and heavy tank battalions gradually became less effective.

Operation BAGRATION

As a result of Soviet deception efforts, the Germans concentrated their armored forces south of Belorussia with Army Groups North Ukraine and South Ukraine and left few armored units with Army Group Center, where the main Soviet offensive known as Operation BAGRATION was focused.⁶⁴ When the Soviet attack began on 22 June 1944 only one heavy tank battalion, s.Pz.-Abt. 501, was assigned to Army Group Center.⁶⁵ OKH assigned four heavy tank battalions, s.Pz.-Abt. 505, 506, 507, and 509, to Army Group North Ukraine.⁶⁶ More fateful for the Germans, is the fact that in the early part of June, s.Pz.-Abt. 501 gave up nine of its Tigers to s.Pz.-Abt. 509, attached to Army Group North Ukraine, to bring it up to full strength. This left s.Pz.-Abt. 501 with only twenty Tigers in the battalion.⁶⁷

After the Soviet attack, Army Group Center committed s.Pz.-Abt. 501 immediately, and it fought around the Orscha junction with 256th Infantry Division, 14th Infantry Division, and 78th Sturm Division beginning on 23 June 1944 (see figure 11).⁶⁸ Because these units were overwhelmed and destroyed within the first few days of fighting, reports concerning this battalion are incomplete. Probably only six Tigers from this battalion ever made it back across the Berezina River, ferrying over on 1 or 2 July 1944.⁶⁹ On 4 July 1944, the battalion received five new Tigers and fought around Minsk with several recently repaired Tigers. The battalion's last two Tigers were destroyed

when they ran out of fuel on 5 July 1944 fighting near Molodechno.⁷⁰ In less than two weeks of fighting, this battalion was completely destroyed.

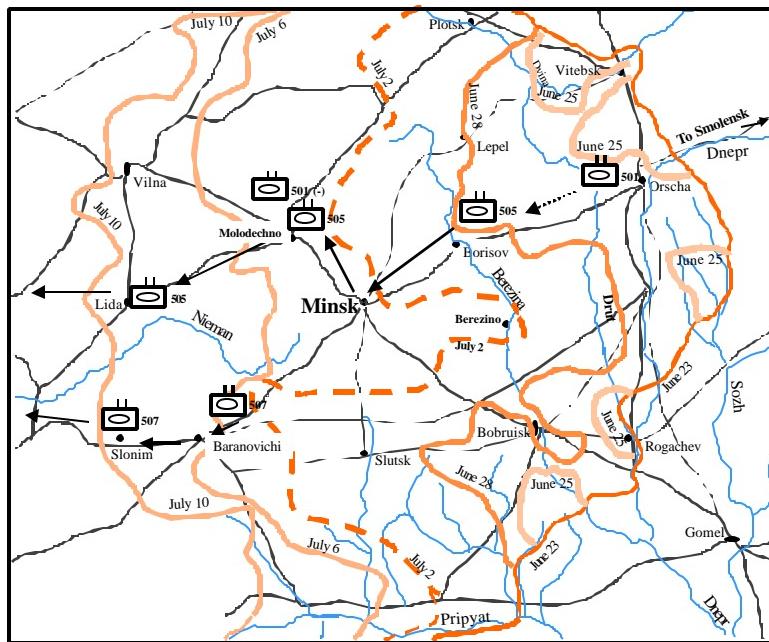


Fig. 11. Heavy Tank Battalions During Operation BAGRATIOn.

Information is so incomplete for this unit that no reasonable assessment can be made about its employment. However, it is clear that the twenty-five Tigers fielded by this battalion were wholly inadequate to stop the Soviet attack against Army Group Center.

Once the Germans realized that the main Soviet attack was on Army Group Center, the other two heavy tank battalions involved in fighting during Operation BAGRATIOn, s.Pz.-Abt. 505 and 507, loaded onto trains for transport from Army Group North Ukraine on 24 and 22 June 1944, respectively. Army Group Center

attached the first heavy tank battalion to arrive, s.Pz.-Abt. 505, to the 5th Panzer Division and employed it as a blocking force northeast of Borisov (see figure 11).⁷¹ Its task was to stop the Soviet armored attacks along the Moscow-Minsk highway and to defend the bridges across the Berezina River near Borisov.⁷²

The battalion fought against the 3d Byelorussian Front near Krupki and Borisov from 27 to 30 June 1944. During this time, it destroyed more than seventy enemy tanks while losing nine Tigers, all due to enemy action.⁷³ More importantly, as part of the 5th Panzer Division, they held open the major Moscow-Minsk highway crossings of the Berezina River for four days, allowing other German units to withdraw to the west.

After the Soviets crossed the Berezina north and south of Borisov, 5th Panzer Division and s.Pz.-Abt. 505 withdrew northwest of Minsk. From 1 to 6 July 1944, the battalion fought around Molodechno.⁷⁴ On 7 July 1944, Soviet forces cut the battalion's line of communication, forcing them to destroy twelve Tigers that were damaged and to retreat to the west.⁷⁵ The battalion, greatly dispersed, finally arrived in Grodno, around 200 kilometers west of Minsk, on 9 July 1944.⁷⁶ Sources vary, but at least eleven and probably twenty-four Tigers from the battalion survived the retreat.⁷⁷ OKH ordered the survivors of the battalion back to Germany to be re-equipped with the new Tiger II.⁷⁸

During Operation BAGRATION, s.Pz.-Abt. 505 destroyed 128 enemy tanks while losing around 21 Tigers. During desperate defensive and retrograde actions where it was always outnumbered, this battalion managed to achieve a 6.1 to 1 kill ratio.

The other heavy tank battalion to arrive from Army Group North Ukraine was s.Pz.-Abt. 507. This battalion detrained at Baranovichi on 2 July 1944 after Soviet forces cut the main road to Minsk.⁷⁹ This battalion fought around Baranovichi and Slonim until

10 July 1944 (see figure 11).⁸⁰ After the Soviet forces captured Lida and Vilna, the battalion withdrew, finally arriving across the Narev River at Trzeszczotki on 20 July 1944.⁸¹

In all, the battalion lost ten Tigers, with one Tiger being destroyed by its own crew.⁸² Available records do not provide information on the damage inflicted upon the enemy forces so a comparison of losses cannot be done. The battalion was successful in delaying the Soviet advance for over seven days along the Soviet southern axis of attack, although by this point the Soviets were probably very close to culminating anyway.⁸³

It is difficult to judge these battalions' effectiveness because records are incomplete. Two of these battalions fought against the most powerful Soviet attacks, s.Pz.-Abt. 501 around Orscha and s.Pz.-Abt. 505 northwest of Minsk. It can be inferred that all three battalions were locally and temporarily successful at stopping the Soviet advance. Both s.Pz.-Abt. 505 and 507 only withdrew to avoid encirclement after their line of retreat was cut or threatened. Also worthy of mention is the relatively low number of Tigers destroyed because they could not be recovered. This is especially impressive considering the fluid nature of the battle and the great distances these battalions traveled during their withdrawals.

Normandy

Three heavy tank battalions were involved in combat in Normandy. Two of these were SS heavy tank battalions that were assigned to the I and II SS Panzer Corps. The last was s.Pz.-Abt. 503, which was attached to the 21st Panzer Division throughout the campaign.⁸⁴ This makes the employment of these battalions unique in that they were not shuffled around the front from unit to unit, but were assigned permanently, in the case of

s.SS.Pz.-Abt. 501 and 502, or kept in support of the same division, as was the case of s.Pz.-Abt. 503. Another unique aspect is that this was the first combat action with the Tiger II, which was fielded by the 1st Company and the headquarters element of s.Pz.-Abt. 503.⁸⁵ The final unusual aspect about the heavy tank battalions in Normandy is that they were all employed almost exclusively against the British around Caen.

The first heavy tank battalion to reach the invasion area was s.SS.Pz.-Abt. 501. This unit traveled from its training area at Beauvais, near the Belgium-French border, through Paris and finally to Normandy. The battalion was alerted on 6 June 1944 and started to move the next day.⁸⁶ Because of Allied air superiority, the unit moved primarily at night but was still attacked numerous times by fighters and bombers.⁸⁷ The lead elements did not arrive behind the front until the evening of 12 June 1944, with many vehicles broken down enroute.⁸⁸

The first combat engagement of the battalion, the battle of Villers-Bocage, took place on 13 June 1944. Accounts vary greatly, but what is indisputable is that two under strength companies of s.SS.Pz.-Abt. 501, along with elements from the Panzer Lehr Division, managed to defeat the lead brigade of the 7th (UK) Armored Division. This was vitally important because this unit was attempting to exploit a break in the German line between I SS Panzer Corps and XLVII Corps.⁸⁹

The decisive portion of this battle was the virtually single-handed attack made by First Lieutenant Michael Wittmann, the commander of the 2d Company. During this attack, he destroyed the lead British tank and infantry companies, the regimental headquarters element, and portions of the second tank company. In all, he destroyed no less than twelve enemy tanks, thirteen troop carriers and two antitank guns.⁹⁰ In all

though, s.SS.Pz.-Abt. 501 destroyed twenty-three or twenty-four tanks, as well as numerous troop carriers and antitank guns.⁹¹ The real achievement was the fact that it halted the 7th (UK) Armored Division's attack.⁹² By halting the British operation to outflank German forces, this is an example of a tactical engagement that had much larger implications.

In stopping the British offensive, the battalion paid the price of at least five Tigers destroyed. This fact is often overlooked in the telling of the sensational story of Wittmann's attack. The price was high because the battalion, being the only unit available, was forced to enter the town of Villers-Bocage without infantry support to extricate the remaining British forces. This British force was well equipped with six pound antitank guns, the up-gunned Sherman Firefly, as well as infantry carrying PIATs (Projectile, Infantry, Anti-Tank).⁹³

The other two heavy tank battalions, s.Pz.-Abt. 503 and s.SS.Pz.-Abt. 502, also experienced difficulties in reaching the front because of Allied air superiority. Trains had to be unloaded around Paris for s.SS.Pz.-Abt. 502 but managed to get to Dreux, eighty kilometers west of Paris, for s.Pz.-Abt. 503. Allied air superiority and mechanical breakdowns caused these battalions to "trickle" to the front. For example, although most of the trains carrying s.SS.Pz.-Abt. 502 were unloaded by 27 June 1944, as late as 20 July, the battalion still reported that ten Tigers were enroute.⁹⁴

General Guderian appropriately described the difficulties that the heavy tank battalions had to overcome in getting to, and fighting in, Normandy. On 19 June 1944, he wrote to Hitler, "by itself, the highest bravery of the Panzer forces cannot make up for the loss of two branches of the Wehrmacht."⁹⁵ In other words, he was lamenting the

absence of air force and navy participation in stopping the Allied Normandy invasion and probably implying that German armor forces were being asked to do too much considering the many obstacles they had to overcome.

All three heavy tank battalions were employed primarily as mobile reserves, countering enemy penetrations. They accomplished this by counterattacking to defeat the enemy so that the old front line could be re-established. It was not uncommon for a battalion to array its three companies in a dispersed pattern behind the front of the division or corps it was supporting, so that each could react quickly to enemy penetrations. This was probably also done to reduce the size of the potential target. An entire heavy tank battalion in a single assembly area would surely have brought a massive response from the Allied air forces and artillery.

Even General Guderian seems to have supported this dispersion. In a departure from his principle of concentration, he recommended a change of tactics for all tank forces, presumably based upon the restrictive terrain of Normandy.

Whenever armor forces go into action on the Invasion Front, the *Panzer-Kampf-Trupp-Taktik* is to be used instead of the previous tactic of employing concentrated forces. The latter tactics are still to be used in most other circumstances. The *Panzer-Kampf-Trupp-Taktik* consists of close cooperation of small Panzer units combined with *Panzer-Grenadiere* [mechanized infantry] or Infantry units.⁹⁶

S.SS.Pz.-Abt. 501 lost fifteen Tigers between 13 June and 8 July 1944, four of which were destroyed during an air raid.⁹⁷ From 8 July until 20 August 1944, the three heavy tank battalions lost thirty-two Tigers in direct combat. S.SS.Pz.-Abt. 502 lost another five Tigers to air attack but s.SS.Pz.-Abt. 501 lost none.

The worst day for losses from air attack was 18 July 1944 when the 3d Company of s.Pz.-Abt. 503 was virtually wiped out from the massive bombing that preceded Operation GOODWOOD.⁹⁸ This battalion probably lost nine Tigers from air attacks during this bombing.⁹⁹ At least four other Tigers were destroyed in direct combat with the British main attack by the 7th, 11th, and the Guards Armored Divisions during Operation GOODWOOD.¹⁰⁰

After more than a month of combat, the first Tiger was destroyed by its own crew on 16 August 1944.¹⁰¹ During the withdrawal to the Seine River, s.Pz.-Abt. 503 lost twenty-eight of its Tigers from either abandonment or destruction by their own crews.¹⁰² After 20 August 1944 during their retreat, the SS heavy tank battalions destroyed or abandoned twenty-two of their Tigers.¹⁰³ An additional two Tigers sank attempting to cross the Seine River by ferry.¹⁰⁴ Only four Tigers were lost to direct combat after 20 August 1944.¹⁰⁵

These statistics lead to the conclusion that the heavy tank battalions had improved in their vehicle recovery efforts, especially when employed along a fairly static front, but were still extremely vulnerable when forced to retreat. A possible reason for the relatively high number of Tigers destroyed in direct combat, compared to previous encounters, was the fact that the Western Allies were fielding more weapons capable of destroying a Tiger, especially in close range combat as was the norm in Normandy.

These three heavy tank battalions managed to destroy around 510 Allied tanks as well as numerous other vehicles and pieces of equipment.¹⁰⁶ Other than a few Tigers that were shipped back to Germany for factory maintenance, every one of the three battalion's

tanks were lost. Of these 132 Tigers that were lost while committed to or retreating from Normandy, only around 48 were lost due to direct ground combat, although 10 Tigers remain unaccounted for.¹⁰⁷ The overall kill ratio for the loss of every Tiger was 3.9 to 1 while the kill ratio for direct combat was 10.6 to 1.

Until the strategic situation became hopeless then, the employment of the heavy tank battalions has to be judged as successful. For the most part, they were employed in accordance with the portion of their doctrine that called for heavy tanks to form mobile reserves to counter enemy breakthroughs. They adapted this doctrine to the terrain and to the operational situation by splitting the battalions apart into company assembly areas. Prior experience showed, and their employment in Normandy validated, that a handful of Tigers was able to defeat or delay a large enemy armored attack. Also, by assigning companies behind the front but across the width of it, they minimized the distance necessary to travel in order to react to enemy penetrations. Although this reduced the concentration of the battalion, in violation of their doctrine, this must have helped the maintenance status of the battalions because of reduced vehicular movement.

The Final Battles

During the last six months of the war heavy tank battalions were heavily engaged in fighting on all fronts. The missions given were predominately as a mobile reserve behind the front line. As the war neared its end, heavy tank battalions were fragmented across wide areas and were shifted from one area to another.

There are notable exceptions when battalions took part in offensive operations, albeit usually very limited ones. Two heavy tank battalions took part in the Battle of the Bulge, or as German forces called it, Operation WATCH ON THE RHINE. Two heavy

tank battalions also participated in the limited attack in Hungary, known as Operation SOUTHWIND, that eliminated the Soviet Gran bridgehead. In the final German offensive of the war, Operation SPRING AWAKENING, two heavy tank battalions participated. Coincidentally, s.SS.Pz.-Abt. 501 participated in every one of these offensives.

WATCH ON THE RHINE: The Battle of the Bulge

Both of the heavy tank battalions that took part in the Battle of the Bulge, s.SS.Pz.-Abt. 501 and s.Pz.-Abt. 506, were equipped with new Tiger II tanks. The SS battalion, as an organic unit of the I SS Panzer Corps, was attached to the 1st SS Panzer Division (*Leibstandarte Adolf Hitler*) or (LAH), which in turn attached it as the second battalion of SS Panzer Regiment 1.¹⁰⁸ This unit, known as Battle Group (KG) Peiper for its commander Lieutenant Colonel Joachim Peiper, was assigned as a spearhead of the attack for the 6th Panzer Army.¹⁰⁹

The Tiger II was not suited for the type of operation envisioned in the German plan. They were very slow and mechanically unreliable. The hilly terrain in the Ardennes further exacerbated the mechanical difficulties. The soft surfaced, narrow roads were also insufficient for such large, heavy vehicles attempting to move quickly. Peiper realized these deficiencies and considered the Tiger II too slow and too heavy for the rapid advance that was required of his unit. Therefore, he placed the entire battalion at the rear of his column.¹¹⁰

Both battalions were largely ineffective during the Battle of the Bulge. Because of breakdowns, problems in supply, and the restrictive terrain, only small numbers of

Tiger IIs ever fought together as a unit. From 17 December 1944 to 13 January 1945 both battalions lost twenty-two Tigers.¹¹¹ S.Pz.-Abt. 506 lost six in direct combat and another from an Allied air attack.¹¹² The SS battalion also lost six in direct combat but abandoned or destroyed another nine Tiger IIs.¹¹³ Because of the fragmentation of the battalion, records are unclear on exact reasons for Tiger II losses in s.SS.Pz.-Abt. 501. It appears most were damaged or disabled before being destroyed or abandoned by the crew.¹¹⁴ Until 17 January 1945 when U.S. forces attacked around Bastogne, s.Pz.-Abt. 506 did not destroy or abandon any of its tanks. Because of the U.S. attack and the battalion's subsequent hasty withdrawal, they were forced to destroy three Tigers.¹¹⁵

Probably only a handful of enemy tanks, possibly as few as twenty, were destroyed by both heavy tank battalions during the Battle of the Bulge.¹¹⁶ This may have been due to a number of reasons. First, only a portion of each battalion managed to make their way forward to come into contact with the enemy. Also, there were initially only a few Allied tanks committed to the Battle of the Bulge. These factors make the contribution of the heavy tank battalions difficult to judge. Whatever their contributions, it is doubtful that those accomplishments sufficiently offset the loss of twenty-five Tigers.

Hungary 1945

After the Battle of the Bulge, Hitler ordered the 6th (SS) Panzer Army to move to Hungary. This powerful formation was to launch an offensive, Operation SPRING AWAKENING, whose goal was to clear all Soviet forces from the area west of the Danube River and north of the Drava River and to secure the Nagykanizsa oil fields.¹¹⁷ Prior to that however, German forces had to eliminate Soviet forces established in a

strong bridgehead across the Gran River north of Esztergom. This almost twenty by twenty kilometer bridgehead was a potential assembly area for a major Soviet thrust towards Vienna, and in order to secure the German lines of communication, it had to be eliminated prior to the main offensive around Budapest.¹¹⁸ The elimination of this bridgehead was given the operational name of SOUTH WIND.

Two heavy tank battalions took part in this offensive. S.SS.Pz.-Abt. 501 was still attached to the KG Peiper, part of the LAH. This division was also still part of the I SS Panzer Corps, to which the s.SS.Pz.-Abt. 501 belonged organically.

The second heavy tank battalion was the s.Pz.-Abt. 503 (FHH) which had been operating in Hungary since mid-October 1944 after having been reconstituted following its destruction in Normandy.¹¹⁹ This battalion was assigned as an organic unit of the Panzer Corps FHH on 19 December 1944.¹²⁰ For this operation, the battalion was placed under the operational control of the Reichs Grenadier Division "*Hoch und Deutschmeister*."¹²¹

Neither heavy tank battalion was at full strength for this operation. S.SS.Pz.-Abt. 501 had thirty-six Tiger IIs but only nineteen were on hand and operational for the start of the attack.¹²² S.Pz.-Abt. 503 (FHH) had twenty-two on hand, all of which were operational for the beginning of the attack.¹²³

The attack began at 5:00 A.M. on 17 February 1945 with Panzer Corps FHH leading and I SS Panzer Corps following (see figure 12). S.Pz.-Abt. 503 (FHH) attacked in the vanguard and was successful in penetrating the Soviet defenses.¹²⁴ During this attack, the battalion lost one Tiger to antitank gunfire.¹²⁵ This was the only Tiger lost by either battalion during the entire operation. During the afternoon, both battalions led the

attack to the Parizsky Canal.¹²⁶ This attack was probably the only instance where two heavy tank battalions attacked together toward a common objective.

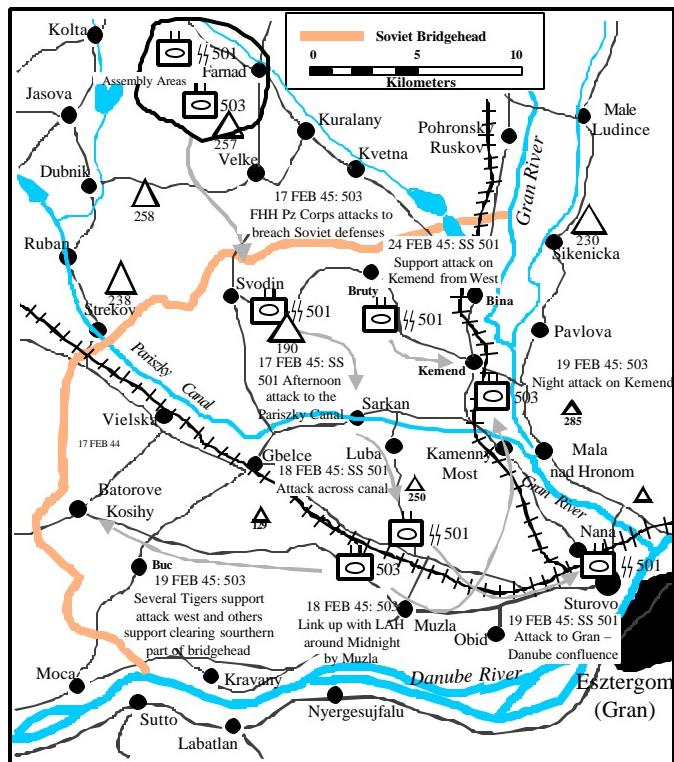


Fig. 12. Heavy Tank Battalions in Operation SOUTHWIND.

On 18 February 1945, s.SS.Pz.-Abt. 501 attacked out of the small bridgehead over the Parizsky Canal to key high ground north of Muzsla. Around midnight, s.Pz.-Abt. 503 (FHH) linked up with elements of the LAH in the same vicinity. During their attack south, they ran into an extensive minefield. Without the support of infantry or engineers, dismounted tank commanders and other crewmen breached the minefield by clearing paths for the tanks.¹²⁷

The next day, 19 February 1945, s.SS.Pz.-Abt. 501 continued its attack as part of the LAH to the confluence of the Gran and the Danube Rivers. During the day, s.Pz.-Abt. 503 (FHH) supported a number of small attacks to secure the entire southern portion of the bridgehead.¹²⁸

That night, s.Pz.-Abt. 503 (FHH) conducted an unsupported attack against the Soviet strongpoint in the village of Kemend that was stopped by an extensive minefield.¹²⁹ The battalion supported the further reduction of the bridgehead by assuming defensive positions to contain Soviet forces.

S.SS.Pz.-Abt. 501 took part in the final attack in the bridgehead that eliminated the Soviet strongpoint in Kemend. On 24 February 1945, the battalion attacked from the west with the rest of KG Peiper and was successful in eliminating this Soviet strongpoint.¹³⁰

Although records do not indicate how many enemy tanks were destroyed by each unit, this operation must be deemed as a complete success. The two heavy tank battalions led the two corps' during the important stages of the operation and only suffered the loss of one Tiger. This was done against a prepared Soviet defense that included 60,000 men, between 100 and 230 tanks and SU's, and over 100 antitank guns.¹³¹

Although these battalions only had one Tiger destroyed, their maintenance elements had difficulty repairing damaged Tigers as well as conducting routine tank maintenance. At the end of Operation SOUTHWIND, s.SS.Pz.-Abt. 501 only had four Tiger IIs operational out of thirty-six on hand.¹³²

Immediately following this operation, I SS Panzer Corps moved south to prepare for its next operation, SPRING AWAKENING. This battalion only had nine days to

recover from SOUTHWIND before beginning SPRING AWAKENING. Because of this, s.SS.Pz.-Abt. 501 was unable to increase the number of operational Tiger IIs, beginning the SPRING AWAKENING with around four Tiger IIs.¹³³

In addition to s.SS.Pz.-Abt. 501, s.Pz.-Abt. 509 was also involved in SPRING AWAKENING. This battalion, as part of III Panzer Corps, operated in a supporting role as the northern portion of the German attack. This battalion began the operation with thirty-two operational Tiger IIs.¹³⁴

Both heavy tank battalions experienced great difficulties during the offensive because of the muddy and swampy terrain. Because the Soviets did not use very many armored vehicles to counter this offensive, SPRING AWAKENING turned out to be a primarily infantry battle on both sides.

In the main attack area, s.SS.Pz.-Abt. 501 did not contribute greatly during the offensive. Along with the rest of KG Peiper, they generally trailed the lead two panzer-grenadier regiments of the LAH division during the attack (see figure 13). Even though the LAH division was able to establish a bridgehead across the Sio River, the Tiger IIs of s.SS.Pz.-Abt. 501 were not ferried across.

Because German intelligence indicated the possibility of a Soviet counter-offensive, LAH consolidated s.SS.Pz.-Abt. 501 near the town of Deg on 14 March 1945. After the Soviets began their offensive the next day, I SS Panzer Corps committed KG Peiper and the eight operational Tiger II of s.SS.Pz.-Abt. 501 to stopping the enemy penetrations to the northwest around Stuhlweissenburg (Szekesfehervar) and Varpalota. These eight tanks were split apart, with one or two Tiger IIs operating with other types of tanks from KG Peiper. On several occasions, a handful of Tigers knocked out large

numbers of Soviet tanks and armored vehicles. On 20 March 1945, one Tiger II destroyed fifteen Soviet tanks by Varpalota and on the next day, a single Tiger II supported by two Panthers destroyed another seventeen enemy tanks.¹³⁵ On 21 March 1945, however, the battalion began a long series of delaying actions that eventually led to its surrender to the U.S. Army near Steyr, Austria.¹³⁶

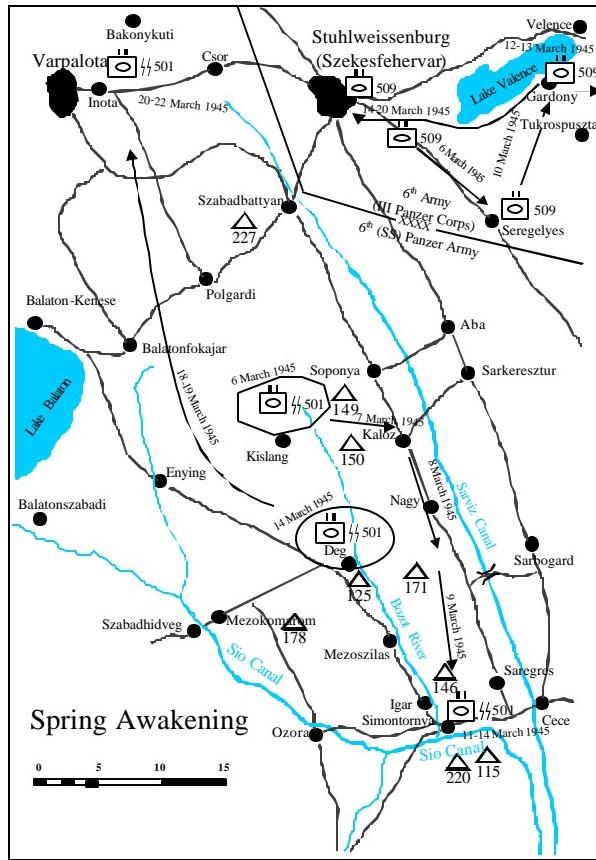


Fig. 13. Heavy Tank Battalions in Operation SPRING AWAKENING.

There is not much information available on the actions of s.Pz.-Abt. 509 or of III Panzer Corps. This battalion was either in the lead echelon or directly supported the lead units and was directly responsible for the success of an attack on at least two occasions. On 6 March 1945, forward units of III Panzer Corps were not able to neutralize some Josef Stalin-2s (JS-2, Soviet Heavy Tanks) near Seregelyes (see figure 13). Two Tiger IIs from the battalion went forward and destroyed six JS-2s, allowing the attack to continue.¹³⁷ On 13 March 1945, lead elements of III Panzer Corps encountered twenty-four SU-152s in prepared defensive positions protected by a minefield. During the battalion's attack on this complex, every one of the sixteen operational Tiger IIs was severely damaged and three were totally destroyed. After lanes were cleared in the minefield, two Tiger IIs managed to destroy all of the SU-152s.¹³⁸

During the offensive, s.Pz.-Abt. 509 lost three Tigers, with many others damaged but repairable, and destroyed at least thirty enemy tanks or armored vehicles. This battalion was directly responsible for breaking through several layers of the Soviet's tactical defense and managed to achieve a 10 to 1 kill ratio.

The Vistula-Oder Operation

In January 1945, two heavy tank battalions faced the Soviet bridgeheads of the 1st Ukrainian Front and the 2d Belorussian Front across the Vistula and Narew Rivers. In Army Group A's sector, s.Pz.-Abt. 501 was attached to the XXIV Panzer Corps which was the operational reserve for the 4th Panzer Army. Its mission was to destroy enemy penetrations of the German defenses around the Sandomierz Bridgehead. Further north, s.Pz.-Abt. 507, as part of Army Group Center, was attached to the 2d Army and had a similar task against Russian bridgeheads across the Narew River.¹³⁹

S.Pz.-Abt. 501 was a powerful unit at this time. This battalion had between forty-one and forty-five Tiger IIs and had recently taken over s.Pz.-Abt. 509's remaining Tigers so that it had a total strength of fifty-two Tiger and Tiger II tanks.¹⁴⁰ This battalion concentrated, along with the remainder of the XXIV Panzer Corps, well forward in the defensive sector so that they were near the front lines. Furthermore, their assembly area was in an area that was swampy and required the tanks to stay primarily on the roads. This battalion occupied the same assembly area as the 17th Panzer Division, although it is unclear whether they were formally attached to this division or not (see figure 14).¹⁴¹

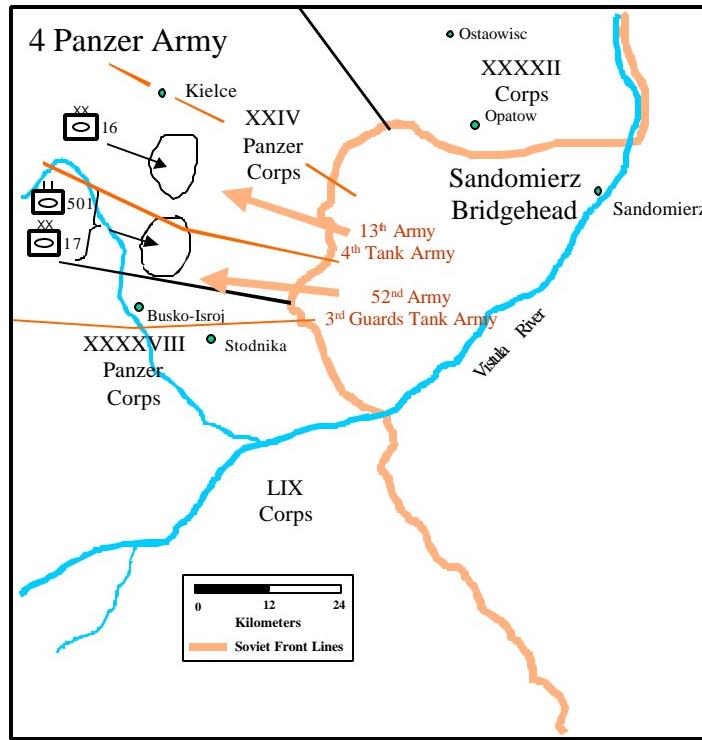


Fig. 14. The Sandomierz Bridgehead and the Destruction of s.Pz.-Abt. 501.

Records indicate that everyone in the chain of command from the battalion commander to Army Group A commander did not agree with the positioning of these units so far forward.¹⁴² Even though some members of the s.Pz.-Abt. 501 claimed that they were being sabotaged, according to the commander of the 17th Panzer Division, the orders came from Hitler. Others have speculated that they were ordered forward to provide morale support for the infantry manning the front line defenses.

Whatever the case, when the main Soviet attack came on 12 January 1945, the German operational reserve units were quickly overrun or bypassed. After waiting most of the day, s.Pz.-Abt. 501 received word that the 17th Panzer Division headquarters was being overrun by Soviet tanks.¹⁴³ After an unsuccessful attempt that day, the attack to relieve the divisional command post was continued on 13 January 1945. During this attack, the battalion destroyed twenty-seven tanks without losing a single Tiger.¹⁴⁴ Nevertheless, the attack was halted and the battalion consolidated to begin its retreat, or more specifically because it had been bypassed, its attack to the rear. The battalion's objective was to reach the city of Kielce via the town of Lisow. During the movement to Lisow, several tanks got stuck in the mud.

Presumably the Soviets were aware of the battalion's existence because, based upon available reports, they prepared an ambush for this battalion in the town of Lisow. By the end of the day, the majority of s.Pz.-Abt. 501 was destroyed. The few remaining tanks and crews continued to fight on and joined part of 'Nehring's Wandering Pocket,' named for the commander of the XXIV Panzer Corps, General Walther K. Nehring.¹⁴⁵ The few vehicles that did survive the Soviet ambush were reportedly destroyed later

because they ran out of fuel, although one Tiger may have made it all the way back to Berlin.¹⁴⁶

Further north, s.Pz.-Abt. 507, like s.Pz.-Abt. 501, was over strength and fielded a total of fifty-one tanks, all Tigers. This battalion fared much better, in large part because they were not in the direct path of the main Soviet offensive. They were spread out behind the front in separate company assembly areas, similar to heavy tank battalion employment in Normandy. From 16 to 19 January 1945, this battalion destroyed ninety-six enemy tanks while losing only four Tigers.¹⁴⁷ Its efforts could not stop the Soviet offensive and it began to withdraw west on 19 January 1945. From 19 to 30 January 1945, forty-one Tigers were lost with the majority being destroyed by their own crews. Of those forty-one Tigers, twenty-two reached the east bank of the Vistula. However, because ferries were not available, the battalion destroyed them to avoid capture.¹⁴⁸ By 13 February 1945, one month after the beginning of the Soviet Vistula offensive, s.Pz.-Abt. 507 was reduced to two Tigers.¹⁴⁹

Obviously, s.Pz.-Abt. 501 was ineffective in its employment as a part of the mobile reserve defending the Sandomierz Bridgehead. It was positioned so far forward that it was unable to react to enemy penetrations of the front line before those penetrations bypassed them. Their assembly area also was in an area that degraded their mobility in that it limited them primarily to existing roads. Also, although adhering to the concept of concentration by consolidating the entire battalion, the Germans were unable to counter, or even slightly influence, the many Soviet penetrations from the bridgehead. From the results, it is apparent that the Soviets exploited these poor German decisions, and thus eliminated s.Pz.-Abt. 501.

In contrast, s.Pz.-Abt. 507 appears to have been very effective in destroying enemy penetrations, although the deteriorating strategic situation to their south ultimately forced them to experience sever losses during their retreat. Positioning elements of the battalion across a wider frontage, and locating those elements further in depth, helped them inflict heavy damages upon the attacking Soviet armored forces. Prior to its retreat, this battalion destroyed twenty-four tanks for the loss of each Tiger.

During the last six months of the war, eleven heavy tank battalions were destroyed fighting against the Russians. These battalions usually fought with significantly fewer tanks than the forty-five that they were authorized. Even with only a handful of Tigers, these units were able to destroy large numbers of enemy tanks on many occasions.

Four heavy tank battalions, s.SS.Pz.-Abt. 501, s.Pz.-Abt. 501, 503 (FHH) and 509, fought in Hungary and their remnants retreated to Austria or Czechoslovakia before the war ended. The 3d Battalion of Panzer Regiment *Grossdeutschland*, s.Pz.-Abt. 502, 505, and 507 all fought in the northern part of Germany, Poland, and East Prussia. Their last battles, with only a few Tigers, were in places like Pillau, the Frishe Nehrung, and Konigsberg. S.Pz.-Abt. 510 fought as part of Army Group North (later called Army Group Kurland) in the Kurland Peninsula, ultimately surrendering to Soviet forces at the end of the war.¹⁵⁰ Prior to that surrender, one company was transported back to Germany and participated in the fighting in the Ruhr pocket.

After s.Pz.-Abt. 501 was destroyed along the Vistula in January 1945, only two heavy tank battalions defended along the front east of Berlin. These were the two remaining SS battalions, s.SS.Pz.-Abt. 502 and 503. Both of these battalions operated

with far fewer tanks than the forty-five authorized and what tanks they did have were usually employed in small elements. Although both battalions fought in a wide variety of places, s.SS.Pz.-Abt. 503 was spread out across the battlefield from January until the end of the war. This battalion, or elements of it, fought around Kustrin, in Gotenhafen, and Danzig. Some parts of the battalion even participated in the attack out of Pomerania, called Operation WINTER SOLSTICE, in February 1945.¹⁵¹ At late as 2 May 1945, this battalion still had seven Tiger IIs fighting in Berlin.¹⁵²

Also during the last six months of the war, three heavy tank battalions were destroyed fighting the Western allies. Two battalions, s.Pz.-Abt. 504 and 508 fought in northern Italy. The remaining battalion, s.Pz.-Abt. 506, fought in Western Germany following its participation in the Battle of the Bulge, and surrendered to US forces in the Ruhr pocket.

Summary

The last two years of the war saw a dramatic increase in the number of heavy tank battalions. By the end of the war, some battalions had been destroyed and reestablished two or three times. OKH and OKW committed the heavy tank battalions of the army and Waffen SS to almost every region of the European theater during the last two years of the war.

The doctrine for the employment of the heavy tank battalions did not change officially during this time. This doctrine continued to be focused solely on the offensive, even though the battalions participated primarily in defensive battles. The principle of concentration, extremely important and valid in the offense, was also stressed in these defensive battles. This may have been a valid principle in the defense conceptually. In

reality the limitations of the Tiger and Tiger II, along with the vast defensive frontages along which they were employed, invalidated this principle in many situations.

When heavy tank battalions were concentrated in the defense, they were generally easier to bypass and/or were targeted for destruction by Allied armored units or from the air. The enemy naturally preferred to avoid the concentrated heavy tank battalions.

When concentrated, the movement of the battalions to the threatened area reduced the operational number of Tigers because of their high maintenance requirements.

In the defense, heavy tank battalions were most effective when employed as a reserve force to counterattack enemy penetrations instead of as a frontline force. They were also most effective when they were dispersed along the breadth of the defensive front to cover more avenues of approach. This was especially true when the terrain restricted vehicular movement to a few avenues of approach.

When employed in the offense, heavy tank battalions achieved mixed results. Their failure can be attributed primarily to poor terrain but credit also has to be given to their enemy's increased ability to destroy the Tiger and Tiger II by the fielding of higher caliber and velocity weapons. Also, the widespread employment of mines severely degraded the heavy tank battalion's effectiveness in breaking through the enemy's defenses. Operation SOUTHWIND and s.Pz.-Abt. 509's involvement in Operation SPRING AWAKENING are two notable exceptions and examples of successful employment of heavy tank battalions in the offense. During Operation SOUTHWIND specifically, heavy tank battalions were extremely effective and important in breaking through several echelons of prepared defenses.

¹Hans-Joachim Schwaner, Battalion Commander, “After Action Report on the Employment of the 502nd Heavy Panzer Battalion in the 16th Army Sector from 4 July to 17 August 1944,” dated 20 August 1944 in *Tigers in the Mud*, Otto Carius (Winnipeg, Manitoba: J. J. Fedorowicz Publishing, 1992), 240.

²Robin Cross, *Citadel: The Battle of Kursk* (New York: Sapredon, 1993), 234.

³Jentz, *Tiger I & II: Combat*, 125.

⁴Ibid.

⁵See Major Gomille, “Report of III.(Tiger) Abteilung/Panzer Regiment Grossdeutschland,” dated 31 August 1943; Captain Graf Kageneck, “Experience in Panzer Operations” by s.Pz.-Abt. 503, dated 10 October 1943; Major Withing, “Preliminary Experience Report for Tiger Abteilung 506,” dated 30 September 1943; Major Gierka, “Tiger Abteilung 509 Report” [Extract], dated 17 December 1943 in *Tiger I & II: Combat Tactics*, Jentz, 124, 128-132, 135-137, 139-140, 142-144, 146, 148.

⁶Withing, “Preliminary Experience Report for Tiger Abteilung 506,” dated 30 September 1943 in *Tiger I & II: Combat Tactics*, Jentz, 135-137.

⁷Ibid.

⁸Ibid.

⁹Ibid.

¹⁰Ibid., 137.

¹¹Ibid.

¹²Schneider, *Tigers in Combat I*, 316.

¹³Lange, “Experience Report from Tiger Abteilung 506,” dated 15 January 1944 in *Tiger I & II: Combat Tactics*, Jentz, 144.

¹⁴Ibid.

¹⁵Schneider, *Tigers in Combat I*, 159.

¹⁶Ibid.

¹⁷Alfred Rubbel, “Tscherkassy,” in *The Combat History of Schwere Panzer-Abteilung 503*, 120.

¹⁸Ibid., 118.

¹⁹Ibid., 118, 122.

²⁰See Franz Bake, “The Balabanowka Pocket (25 January-30 January 1944),” in *The Combat History of Schwere Panzer-Abteilung 503*, 122; Schneider, *Tigers in Combat I*, 160. These numbers are only from German sources and as such, are unconfirmed.

²¹Schneider, *Tigers in Combat I*, 160, 226.

²²Rubbel, “The Operations of Schwere Panzer-Abteilung 503 in Opening the Tscherkassy Pocket,” in *The Combat History of Schwere Panzer-Abteilung 503*, 132.

²³Ibid., 135.

²⁴Ibid., 136.

²⁵Schneider, *Tigers in Combat I*, 160-161.

²⁶If half of the kills are attributed to each battalion of Heavy Panzer Regiment Bake, then s.Pz.-Abt. 503 destroyed 164 enemy tanks which equals a 7.5 to 1 kill ratio.

²⁷Schneider, *Tigers in Combat I*, 375.

²⁸Ibid., 380.

²⁹Ibid., 236, 242.

³⁰Kleine and Kuhn, *Tiger*, 247.

³¹Jentz, *Tiger I & II: Combat Tactics*, 93.

³²Schneider, *Tigers in Combat I*, 236, 375.

³³Jentz, *Tiger I & II: Combat Tactics*, 93.

³⁴See Kleine and Kuhn, *Tiger*, 247; Schneider, *Tigers in Combat I*, 236, 375; Martin Schmidt, Major General, *Employment of Panzer Units in Central Italy in 1944, and Peculiarities Thereof*. MS #D-204. (Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1947), 4.

³⁵Schneider, *Tigers in Combat I*, 236, 375.

³⁶Ibid., 375-376.

³⁷Kleine and Kuhn, *Tiger*, 247.

³⁸Schneider, *Tigers in Combat I*, 376.

³⁹GMDS by a combined British, Canadian, and U.S. Staff, *The German Operation at Anzio: A Study of the German Operations at Anzio Beachhead from 22 Jan 44 to 31 May 44* (Camp Ritchie, Maryland: German Military Documents Section, Military Intelligence Division, War Department, 9 April 1946), 107.

⁴⁰“Report of Activities of 3.Kompanie/schwere Panzer-Abteilung 508 between 23-25 May 1944,” in *Tiger I & II: Combat Tactics*, Jentz, 97-98. During the withdrawal forward of the railway embankment, an antitank gun damaged one Tiger, forcing the crew to destroy it. Eleven Tigers withdrew to the embankment and the company commander ordered five Tigers to continue to hold the enemy while six were used to tow away the three Tigers which had originally failed to cross. Four of the six towing Tigers experienced transmission trouble and were destroyed by their crews. Two of the five operational Tigers assisted in towing away the new breakdowns. These eight got back to Cori, leaving only four Tigers operational. Of these, one was hit by antitank fire and two had transmission trouble, causing their crews to destroy them. The last Tiger also broke down but was towed back to Rome during the night of 24/25 May 1944.

⁴¹Schneider, *Tigers in Combat I*, 408.

⁴²Ibid., 377.

⁴³Restayn, *Tiger I on the Western Front*, 81.

⁴⁴AFV(T) G-H/JB, Technical Branch, “Who Killed Tiger?” dated August 1944 in *Tiger!*, Fletcher, 215-218.

⁴⁵Ibid., 216.

⁴⁶Schneider, *Tigers in Combat I*, 377.

⁴⁷Ibid., 236.

⁴⁸Ibid., 236-237, 263.

⁴⁹Ibid., 379, 408.

⁵⁰Ibid., 379.

⁵¹Ibid., 378.

⁵²See Ibid., 381, 408; Restayn, *Tiger I on the Western Front*, 60; GMDS, *The German Operation at Anzio*, 64, 68, 107. Discrepancies exist in the number of enemy tanks destroyed. For example, the Germans claim 3, 17, and 15 tanks destroyed on 21 February 1944, 24 February 1944, and 23 May 1944, respectively. U.S. and British sources admit to only 5, 2, and 20 tanks lost along the entire Anzio front during those same days. In this case, I used the German claim during the entire Italian Campaign.

⁵³Schneider, *Tigers in Combat I*, 408.

⁵⁴Ibid., 263.

⁵⁵Ibid.

⁵⁶Ibid.

⁵⁷Jentz, *Tiger I & II: Combat Tactics*, 98-99.

⁵⁸Jentz, *Panzertruppen: 1943-1945*, 204-205.

⁵⁹Schneider, *Tigers in Combat II*, 255, 327.

⁶⁰Schneider, *Tigers in Combat I*, 164, 443.

⁶¹Ibid., 45, 276, 319-320. S.Pz.-Abt. 501 was totally destroyed, s.Pz.-Abt. 505 transported 11 Tigers back to factories in Germany and s.Pz.-Abt. 506 handed its 6 remaining Tigers over to s.Pz.-Abt. 507.

⁶²See Schneider, *Tigers in Combat I*, 165.; idem, *Tigers in Combat II*, 260, 262, 333; Restayn, *Tiger I on the Western Front*, 88.

⁶³Generalinspekteur der Panzertruppen, Comments on “Report From a Tiger Company,” Nachrichtenblatt der Panzertruppen, September 1944, in *Tiger I & II: Combat Tactics*, Jentz, 148-152.

⁶⁴Curtis S. King, Major, “Operation Bagration: A Soviet Victory.” *Military Review* (April 1994): 89-90.

⁶⁵Jentz, *Panzertruppen: 1943-1945*, 205.

⁶⁶Ibid.

⁶⁷Schneider, *Tigers in Combat I*, 45.

⁶⁸See Ibid., 45; Steve Zaloga, *Bagration 1944: The Destruction of Army Group Centre* (Hong Kong: Osprey Military Publishing, 1996), 54-55.

⁶⁹Schneider, *Tigers in Combat I*, 45.

⁷⁰Ibid., 45.

⁷¹Zaloga, *Bagration 1944*, 59.

⁷²Ibid.

⁷³See Ibid; Schneider, *Tigers in Combat I*, 275.

⁷⁴Schneider, *Tigers in Combat I*, 275.

⁷⁵Ibid.

⁷⁶Ibid.

⁷⁷See Ibid., 276, 311; Zaloga, *Bagration 1944*, 69.

⁷⁸Schneider, *Tigers in Combat I*, 275.

⁷⁹See Ibid., 351; Zaloga, *Bagration 1944*, 46-47.

⁸⁰Schneider, *Tigers in Combat I*, 352.

⁸¹Ibid.

⁸²Ibid., 351-352, 372.

⁸³Zaloga, *Bagration 1944*, 72-73.

⁸⁴Schneider, *Tigers in Combat I*, 164-165.

⁸⁵Rubbel, “The Battalion Receives the Konigstiger (King Tiger)” in *The Combat History of Schwere Panzer-Abteilung 503*, 234.

⁸⁶Agte, *Michael Wittmann*, 313-316.

⁸⁷Schneider, *Tigers in Combat II*, 256.

⁸⁸Agte, *Michael Wittmann*, 317-318.

⁸⁹Daniel Taylor, *Villers-Bocage: Through the Lens of a German War Photographer* (London: Battle of Britain International, 1999), 9. This operation was codenamed Operation PERCH.

⁹⁰Ibid., 76.

⁹¹Ibid., 76.

⁹²Michael Reynolds, *Steel Inferno: 1st SS Panzer Corps in Normandy* (New York: Dell Publishing, 1997), 126.

⁹³Taylor, *Villers-Bocage*, 65.

⁹⁴Jentz, *Panzertruppen: 1933-1942*, 110.

⁹⁵Guderian, Tactical Analysis of the Situation in Normandy, to Adolf Hitler, 19 June 1944, in *Tiger I & II: Combat Tactics*, Jentz, 177, 180-182.

⁹⁶Guderian, Situation Report Presentation to Adolf Hitler, 28 June 1944, in Thomas L. Jentz, *Panzertruppen: 1933-1942*, 182.

⁹⁷Schneider, *Tigers in Combat II*, 320.

⁹⁸See Restayn, *Tiger I on the Western Front*, 34; Schneider, *Tigers in Combat I*, 164-165; von Rosen, “Operation ‘Goodwood’ 18 July 1944: The Darkest Day for Schwere Panzer-Abteilung 503,” in *The Combat History of Schwere Panzer-Abteilung 503*, 239-242.

⁹⁹Schneider, *Tigers in Combat I*, 164.

¹⁰⁰See Ibid., 164-165; Stephen Badsey, *Normandy 1944: Allied Landings and Breakout* (London: Osprey Publishing, 1990), 62-63.

¹⁰¹See Schneider, *Tigers in Combat I*, 164-165, 226-227; idem, *Tigers in Combat II*, 259-261, 320, 332-333, 365.

¹⁰²Schneider, *Tigers in Combat I*, 164-165, 226-227.

¹⁰³Schneider, *Tigers in Combat II*, 259-261, 320, 332-333, 365.

¹⁰⁴Ibid., 365.

¹⁰⁵Ibid., 259-261, 320, 332-333, 365.

¹⁰⁶Restayn, *Tiger I on the Western Front*, 34, 88, 116.

¹⁰⁷See Schneider, *Tigers in Combat I*, 164-165, 226-227; idem, *Tigers in Combat II*, 259-261, 320, 332-333, 365.

¹⁰⁸See Schneider, *Tigers in Combat II*, 263; Agte, *Michael Wittmann*, 505-507.

¹⁰⁹Michael Reynolds, *Men of Steel, I SS Panzer Corps: The Ardennes and Eastern Front 1944-45* (New York: Sarpedon, 1999), 42-43, 48.

¹¹⁰See Agte, *Michael Wittmann*, 507; Parker, “German Tiger Tanks,” 54.

¹¹¹See Schneider, *Tigers in Combat I*, 321-322, 344; idem, *Tigers in Combat II*, 263-265, 320.

¹¹²Schneider, *Tigers in Combat I*, 321-322, 344.

¹¹³Schneider, *Tigers in Combat II*, 263-265, 320.

¹¹⁴Ibid., 263-265.

¹¹⁵Schneider, *Tigers in Combat I*, 322.

¹¹⁶See Ibid., 321-322, 344; idem, *Tigers in Combat II*, 263-265, 320.

¹¹⁷Reynolds, *Men of Steel*, 187.

¹¹⁸Ibid.

¹¹⁹von Rosen, “Employment in Hungary” in *The Combat History of Schwere Panzer-Abteilung 503*, 282.

¹²⁰Rubbel, “The End of Separate Unit Status: Incorporation into Panzer-Korps ‘Feldherrnhalle’,” in *The Combat History of Schwere Panzer-Abteilung 503*, 309.

¹²¹von Rosen, “Employment in Hungary” in *The Combat History of Schwere Panzer-Abteilung 503*, 299.

¹²²See Reynolds, *Men of Steel*, 190; Schneider, *Tigers in Combat II*, 265.

¹²³See von Rosen, “Employment in Hungary” in *The Combat History of Schwere Panzer-Abteilung 503*, 299; Schneider, *Tigers in Combat I*, 170.

¹²⁴von Rosen, “Employment in Hungary” in *The Combat History of Schwere Panzer-Abteilung 503*, 299.

¹²⁵Ibid.

¹²⁶See Ralf Tiemann, *The Leibstandarte, Volume IV/2*. Translated by Frederick Steinhardt. (Winnipeg, Manitoba: J. J. Fedorowicz Publishing, 1998), 188; Schneider, *Tigers in Combat II*, 265.

¹²⁷von Rosen, “Employment in Hungary” in *The Combat History of Schwere Panzer-Abteilung 503*, 299.

¹²⁸See Ibid., 300; Schneider, *Tigers in Combat I*, 171.

¹²⁹Ibid.

¹³⁰Reynolds, *Men of Steel*, 197.

¹³¹Ibid., 188.

¹³²Schneider, *Tigers in Combat II*, 266.

¹³³Ibid.

¹³⁴Schneider, *Tigers in Combat I*, 419.

¹³⁵Schneider, *Tigers in Combat II*, 266.

¹³⁶Ibid., 267.

¹³⁷Schneider, *Tigers in Combat I*, 419.

¹³⁸Ibid.

¹³⁹Ibid., 353-354. Prior to the battle, s.Pz.-Abt. 501 was officially renamed s.Pz.-Abt. 424 in order to confuse Soviet intelligence.

¹⁴⁰See Schneider, *Tigers in Combat I*, 45-46; Kleine and Kuhn, *Tiger*, 145.

¹⁴¹Major Krebs, “General Staff Officer of the 17th Panzer Division, Situation Evaluation,” in *1986 Art of War Symposium, From the Vistula to the Oder: Soviet Offensive Operations – October 1944 – March 1945*. By Colonel David Glantz. Chairman (Washington, D.C.: Center for Land Warfare, U.S. Army War College, 1986), 610-615.

¹⁴²See Ibid; Schneider, *Tigers in Combat I*, 45-46.

¹⁴³Ibid.

¹⁴⁴See Ibid., 46; Kleine and Kuhn, *Tiger*, 145; Russ Schneider, *Gotterdammerung 1945: Germany’s Last Stand in the East* (Philomont, Virginia: Eastern Front Warfield Books, 1998), 47. Sources vary from between 20-27, although most state that 27 were destroyed. Schneider states that this battalion destroyed a further 50-60 Soviet tanks fighting in and around Lissow.

¹⁴⁵Kleine and Kuhn, *Tiger*, 145.

¹⁴⁶See Ibid; Schneider, *Tigers in Combat I*, 46.

¹⁴⁷Schneider, *Tigers in Combat I*, 354.

¹⁴⁸Ibid.

¹⁴⁹Ibid., 355.

¹⁵⁰Ibid., 446. As late as 10 April 1945, s.Pz.-Abt. 510 still had 13 operational Tigers in Kurland.

¹⁵¹Schneider, *Tigers in Combat II*, 370-371.

¹⁵²Ibid., 375.

CHAPTER 5

ASSESSMENT AND CONCLUSION

“The Tigers!” The panic-stricken cry was flying from mouth to mouth. “The Tigers are coming!”¹

U.S. Soldiers at Kasserine Pass

One hour of Tiger operation requires ten hours of maintenance.²

Alfred Rubbel

The German military developed and fielded the heavy tank battalion to break through an enemy’s tactical defensive belt. These heavy tank battalions were rarely employed as a breakthrough force as originally envisioned, but rather the Germans used them primarily in the defense. Whether in the offense or the defense, its primary purpose was the destruction of enemy tanks in furtherance of operational goals.

Mission Accomplishment

There are only a few examples of heavy tank battalions employed as a breakthrough force. Therefore, it is difficult to assess their effectiveness accurately in the offensive role for which they were developed, organized, and fielded. In the few instances where the German leadership employed a heavy tank battalion as a consolidated unit in the offense, it achieved credible results and was successful in penetrating at least one echelon of the defensive zone.³ These attacks were successful tactical breakthroughs, but they did not lead to the successful operational breakthrough that German theorists originally envisioned. The heavy tank battalions cannot, however, be entirely blamed for the failure to break through at an operational level of war as those theorists envisioned.⁴

If a heavy tank battalion was employed as a consolidated unit in the offense, it was capable of accomplishing its portion of breaking through the initial defensive echelon. Whether other German forces could have accomplished this task is arguable and dependant upon the situation, primarily the terrain and composition of enemy forces.

A Tiger equipped heavy tank battalion had three major deficiencies in the breakthrough battle. First, when the Tigers attacked, the enemy was able to correctly deduce the area of the German main effort. Secondly, Tiger equipped heavy tank battalions were unable to achieve a quick breakthrough, usually requiring an extended amount of time to overcome enemy antitank guns, tanks, and mine fields. If the Tigers had been able to quickly break through the enemy defenses, the first deficiency may not have mattered because other German armored forces would have been able to exploit the breakthrough before the enemy could react. Even these two deficiencies might have been overcome if the Tiger had the ability to exploit their own breakthrough. Although these units were not developed for this, their limited radius of action and high maintenance requirements precluded them from exploiting any breakthrough achieved.

When theorists conceived heavy tank battalions, they thought that defenses would only consist of one, or at most a few, defensive lines. As the war progressed, armies of all sides extended their defensive depth so that there were many defensive echelons to penetrate. This extension of the defense was an effective counter to the heavy tank battalions.

The increased number and effectiveness of antitank guns, as well as the prolific use of mines, also limited the effectiveness of the heavy tank battalions in the offense.⁵ These measures, employed in depth, made achieving a deep breakthrough extremely

difficult. The Tiger helped in penetrating heavy defenses, but never really solved the problem of restoring offensive mobility and movement to the German Army on a tactical or operational level.

In the defense, heavy tank battalions achieved mixed results depending upon many different factors. Heavy tank battalions performed defensive missions far more often than offensive missions. These defensive missions included counterattacks forward to re-establish the front line, occupying front line defensive positions with or without infantry support, and as a reserve force to counter-attack enemy penetrations behind the front line. Generally, even a portion of a heavy tank battalion could defend against an enemy force much more numerous in tanks. If there was an alternative, enemy units bypassed heavy tank battalions rather than attacking them. After being bypassed, the heavy tank battalions became a liability because they could not be repositioned easily and required a large amount of logistic support to do so.

Despite its shortcomings, a measure of the heavy tank battalion's effectiveness, in the offense or defense, can be gauged by the emphasis and level of attention accorded them by their opponents. The Soviets fielded many new weapons and implemented numerous organizational changes to counter the heavy tank battalions. The British conducted several studies of the Tiger, and of the heavy tank battalions, in an attempt to identify weaknesses of each. The Allied intelligence estimate of German forces in the west prior to D-day shows that the heavy tank battalions were the only unit below divisional size that the Allies posted on their theater intelligence map.⁶ These examples show that Germany's enemies took the threat of the heavy tank battalions very seriously and thus provide testimony to their effectiveness.

A Statistical Perspective

The Germans kept detailed records on the loss of each Tiger and on the number of enemy tanks destroyed. The claims of U.S. and British tanks destroyed have been confirmed, to various degrees of reliability, from available records. For Soviet losses, very few records are available to confirm the German claims. In these instances, the German claims are generally accepted without the benefit of verification.

Whatever mission heavy tank battalions were given, their primary task was to destroy enemy tanks. In so doing, they were undeniably successful (see table 4). The kill ratio of heavy tank battalions when measured against Tigers lost in direct combat is an impressive 12.2 to 1. The ratio as measured against all Tigers lost, regardless of reason, is still a credible 5.4 to 1 kill ratio.⁷ Although the last ratio is based upon the total annihilation of every heavy tank battalion, it is probably the most accurate considering that a certain percentage of kills claimed by Tigers must certainly have been repaired and returned to service in the same way that Tigers were returned to service after being damaged.

As would be expected, some heavy tank battalions were more successful than others in destroying enemy tanks. Some battalions were able to destroy close to thirteen enemy tanks for the loss of each Tiger and others were able to achieve only a one for one exchange. Variables that could account for this include the terrain, enemy, leadership and missions assigned. Of these, the missions assigned to heavy tank battalions were the one area that the Germans could most influence. In general, heavy tank battalions were most successful when they were concentrated for offensive missions and dispersed behind the front for defensive missions. Even though results differ greatly from battalion

to battalion, when taken as an overall average, heavy tank battalions were undeniably effective at destroying enemy tanks.⁸

Table 4. Tank Kill Ratio Comparison.

Unit	Tiger Losses			Number Comparison		Ratio of Tigers to Enemy Tanks (1: X)	
	Lost in Action	Dest. by Crew	Unk. or Other	Total Losses	Enemy Tanks Dest.	Kill Ratio (In Action)	Kill Ratio (Total Lost)
III/Pz.Reg GD	62	32	4	98	<500	8.06	5.1
s.SS-Pz.Abt. 501	72	33	2	107	<500	6.94	4.67
s.SS-Pz.Abt. 502	38	29	9	76	~600	15.79	7.89
s.SS-Pz.Abt. 503	10	9	20	39	<500	50	12.82
s.Pz.Abt 501	24	12	84	120	<450	18.75	3.75
s.Pz.Abt 502	88	14	5	107	<1400	15.9	13
s.Pz.Abt 503	113	123	15	252	<1700	15	6.75
s.Pz.Abt 504	29	80	0	109	<250	8.6	2.29
s.Pz.Abt 505	47	62	18	126	<900	19.1	7.1
s.Pz.Abt 506	61	116	2	179	<400	6.56	2.23
s.Pz.Abt 507	43	57	4	104	<600	13.95	5.77
s.Pz.Abt 508	15	46	17	78	<100	6.67	1.28
s.Pz.Abt 509	76	40	5	120	<500	6.58	4.17
s.Pz.Abt 510	35	1	29	65	<200	5.71	3.08
Grand Totals	713	654	214	1580	8600	12.16	5.44
Total Percentages	45%	41%	14%	100%			

Sources: Schneider. *Tigers in Combat I*, 47, 78, 100, 144-145, 173, 226-227, 242, 263, 279, 311, 323, 344, 357, 372, 381, 408, 421, 439, 447, 456; idem, *Tigers in Combat II*, 56, 83, 268, 320, 336, 365, 375, 398.

Notes: S.SS.Pz.-Abt. 503's claims lack credibility. This battalion was never fully equipped and only fought from January 1945 until the end of the war. Committed to the Eastern Theater, it was split apart to many different areas under many different commands. Its records are incomplete and cannot be verified. This battalion fought in places like Kustrin, the Seelow Heights and in Berlin in addition to many others. Jean Restayn claimed that two Tiger IIs destroyed 64 JS-IIs and T-34s in a brief engagement toward the end of the war but it is doubtful that in a little over three months of combat the battalion destroyed more than 500 Soviet tanks.

Areas of Improvement

Despite the success of the heavy tank battalions in destroying enemy tanks, there were deficiencies in the organization and equipment and areas that could have been improved. Almost all of these deal directly or indirectly with Tiger and Tiger II technical and mechanical problems.

These tanks were effective as tank killing weapons, which is evident from the kill ratios. Another virtue of the tanks was that they were very survivable. Frequently when a Tiger was damaged and was subsequently destroyed by its crew, the crew managed to escape capture and return to its unit. This had the benefit of creating experienced crews. These benefits came at a cost in other areas however.

The high degree of maintenance required to keep the Tiger and Tiger II tanks operable was one of their biggest deficiencies. This usually resulted in a low operational rate for tanks within the heavy tank battalions, especially after extended periods of combat. The tendency of the Tigers to break down, coupled with the weight of the tanks, made recovery difficult. The failure to field a suitable recovery vehicle, with the exception of the *Bergpanther*, or to field them in sufficient quantities, resulted in the loss of Tigers in many instances.

Another deficiency of the Tiger was its extremely limited radius of action.⁹ When this was included with the Tiger's maintenance requirements, heavy tank battalions were limited in their ability to conduct mobile operations across an extended area. The Allies exploited this fact during the numerous and frequent operational and strategic

withdrawals of the heavy tank battalions. The result of these deficiencies is clearly seen by the number of tanks destroyed by their own crews (see table 5).

Table 5. Tiger Losses.

Unit	Percentage Losses			Raw numbers			Total Losses
	Lost in Action	Dest. by Crew	Unk. or Other	Lost in Action	Dest. by Crew	Unk. or Other	
III/Pz.R GD	63%	33%	4%	62	32	4	98
s.SS-Pz.Abt. 101	67%	31%	2%	72	33	2	107
s.SS-Pz.Abt. 102	50%	38%	12%	38	29	9	76
s.SS-Pz.Abt. 103	26%	23%	51%	10	9	20	39
s.Pz.Abt 501	20%	10%	70%	24	12	84	120
s.Pz.Abt 502	82%	13%	5%	88	14	5	107
s.Pz.Abt 503	45%	49%	6%	113	123	15	252
s.Pz.Abt 504	27%	73%	0%	29	80	0	109
s.Pz.Abt 505	37%	49%	14%	47	62	18	126
s.Pz.Abt 506	34%	65%	1%	61	116	2	179
s.Pz.Abt 507	41%	55%	4%	43	57	4	104
s.Pz.Abt 508	19%	59%	22%	15	46	17	78
s.Pz.Abt 509	63%	33%	4%	76	40	5	120
s.Pz.Abt 510	54%	>1%	45%	35	1	29	65
Grand Totals				713	654	214	1580
Total Percentages				45%	41%	14%	100%

Sources: Schneider. *Tigers in Combat I*, 78, 144-145, 226-227, 263, 311, 344, 372, 408, 439, 456; idem, *Tigers in Combat II*, 83, 320, 365, 398.

In many instances in the offense, the Germans failed to adhere to their published doctrine. During Operation CITADEL for example, III Panzer Corps divided s.Pz.-Abt. 503's three companies among the corps' three armored divisions. This violated the principle of concentration that was published as being necessary for successful

breakthroughs. Even though s.Pz.-Abt. 505 fought as a unit during Operation CITADEL, it was attached to an infantry division. This violated the guidance directing heavy tank battalions be attached only to other armored units. Thus, when this battalion penetrated the Soviet first echelon defenses, there were no other armored units available to exploit that breach. The first instance where an entire, consolidated heavy tank battalion attacked to break through enemy defenses, as part of an armored force, was not until February 1945 during Operation SOUTHWIND.

After considering the limitations of the Tiger and realizing that the preponderance of missions given to heavy tank battalions were defensive in nature, it is puzzling that the Germans did not develop and publish more guidance and doctrine to meet these facts. The German military leaders stressed the concept of concentration, whether in the offense or the defense. In several instances when the German Army adhered to this principle in the defense, the heavy tank battalion was unable to respond in time or with sufficient combat power to stop the enemy penetrations.

A prerequisite for employing heavy tank battalions as a mobile reserve or as a counterattack force to defeat enemy penetrations was for them to have greater, or at least comparable, mobility and radius of action than the enemy formations they were attempting to defeat. If this criterion was met, then the principle of concentration in the defense might also be applicable. In many instances, because of the deficiencies and limitations of the Tiger, this criterion was not met. In these cases, enemy armored formations attacked in areas absent of heavy tank battalions. This led to many forced operational and strategic withdrawals, during which many Tigers broke down or ran out of fuel. Often, because they could not be recovered, this led to their destruction.

In light of these facts, heavy tank battalions may have been more effective if they had adopted a principle of dispersion in the defense in order to cover more avenues of approach or more defensive frontage. A prime example of the effectiveness of this tactic was s.Pz.-Abt. 502, which operated primarily with Army Group North around Leningrad and in the Baltic states. This area was heavily wooded and swampy, and armored mobility was reduced to the roads. Because of this, the battalion rarely operated as a concentrated unit. Instead, it was spread out and broken down to very small elements to effectively cover all the available armored avenues of approach. This battalion achieved the second highest kill total of all of the battalions and produced the highest overall kill ratio.

In this example, the terrain favored, and in actuality it forced, the dispersion of the battalion. Even across extended defensive frontages encompassing terrain that offered good armored mobility, dispersion may have been more effective than concentrating a heavy tank battalion. A handful of Tigers proved many times that they were capable of stopping a numerically superior enemy. Across an extended frontage, a concentrated heavy tank battalion may have had difficulty getting to an area prior to the enemy forces that were breaking through the front line defenses. In this case, it was probably preferable to counter an enemy penetration with a smaller than desired force than not being able to counter that same penetration at all.

Fulfilling a wide variety of missions in the defense proved to be challenging for the heavy tank battalions. On one hand the E organization battalion may have been the optimal organization for a battalion attacking forward of the main lines, into prepared defenses, because it included only heavy tanks. However, many heavy tank battalions

were tasked with defensive missions on or near the front line. Sometimes these missions were unsupported by other types of units, either infantry or lighter armored forces. In these instances, the D organization battalion would have provided the battalion with a much higher degree of flexibility to accomplish these defensive missions. Since the majority of missions assigned were defensive, it may have been worthwhile for the battalions to return to the D organization. This would have allowed the creation of more battalions, each with a higher degree of flexibility in the performance of missions.

Synthesis and Conclusion

The German heavy tank battalions were an effective combat unit during World War II for killing enemy tanks. They achieved a high kill ratio during both offensive and defensive missions. The German military developed the heavy tank battalion and the Tiger and Tiger II tanks to destroy enemy tanks, whether in the offense or defense. Heavy tank battalions were successful in this area, but their overall kill ratio was reduced because of forced withdrawals over extended distances. These withdrawals caused the loss of many Tigers and highlighted the deficiencies in the Tiger and in the lack of recovery assets within the heavy tank battalions themselves.

The heavy tank battalions were hindered by the failure to adhere to German doctrine on their employment in the offense. German commanders, in several instances, failed to commit a consolidated, concentrated heavy tank battalion in a major attack. During their few offensive missions, heavy tank battalions failed to achieve an operational breakthrough, although they were able to penetrate the first echelon defenses.

The German heavy tank battalions were also hindered by the lack of a coherent, published defensive doctrine based upon the realities and weaknesses of the Tiger.

German commanders continued to stress the importance of concentration in the defense. This was not always an invalid concept, but the lack of dispersal in the defense often denied heavy tanks the ability to counter enemy penetrations in time and with sufficient force. Conversely, in numerous cases where heavy tank battalions dispersed their forces behind the entire frontage, they were very successful at destroying enemy tanks and thus, had a better chance to stop the enemy penetration.

¹Paul Carrel, *Foxes of the Desert* (New York: Bantam Dell Publishing, 1967), 318; quoted in Charles Whiting, *Kasserine: First Blood* (New York: Stein and Day, 1984), 174.

²Alfred Rubbel, “Technical Services and Supply/Logistics” in *The Combat History of schwere Panzer-Abteilung 503*, 27.

³S.Pz.-Abt. 505’s attack as part of the northern pincer of Operation “Citadel,” s.SS.Pz.-Abt. 501 and s.Pz.-Abt. 503’s attacks during Operation “Southwind,” and s.Pz.-Abt. 509’s attack during Operation “Spring Awakening” were all successful at penetrating the first or second echelons of the Soviet defenses.

⁴The Germans did have alternatives that may have been more effective. Perhaps a change in doctrine that provided for universal tank types to accomplish all missions may have accomplished more. Perhaps the Germans could also have produced more Panzer IV’s or Panthers and used these vehicles, in a greater quantity, to achieve greater results than they were able to achieve with the limited number of Tigers produced.

⁵In all the books listed in the bibliography, only two mention a mine roller for the Tiger as a counter to the increased use of mines. Only one of these is from a German source. Otto Carius mentions a mine roller but states that they are not used, probably because of the swampy terrain that s.Pz.-Abt. 502 operated in as part of Army Group North. The Soviet General Staff also mentions Tiger tanks mounting mine rollers during the Battle of Kursk.

⁶Michael Swift and Michael Sharpe, *Historical Maps of World War II: Europe* (London: PRC Publishing, 2000), 85. The map shows 8 heavy tank battalions when in fact there were only 2 in the west at this time.

⁷While many Tigers were lost because they could not be recovered or broke down during extensive withdrawals and must be included in the ratio to obtain an accurate picture, the total Tiger losses includes all Tigers issued to the heavy tank battalions, or total annihilation.

⁸To discover how many enemy tanks each Tiger had to destroy, to be cost-effective at the national level, would require a macro-economic study of all countries involved in W.W. II, incorporating labor, time, and natural resources/minerals.

⁹Franz Bake, quoted in Kleine and Kuhn. *Tiger*, 97; Dr. Bake cites the limited radius of action as the greatest disadvantage of the Tiger. He took part in nearly 500 missions in virtually every type of German tank and was one of the few WW II German tank commanders who was involved in the tank battle at Cambrai during WW I.

BIBLIOGRAPHY

Books

- Adair, Paul. *Hitler's Greatest Defeat: The Collapse of Army Group Centre, June 1944.* London: Arms and Armour Press, 1996.
- Agte, Patrick. *Michael Wittmann and the Tiger Commanders of the Leibstandarte* (Michael Wittman erfolgreichster Panzerkommandant in Zweiten Weltkrieg und die Tiger der Leibstandarte SS Adolf Hitler). Translated by David Johnston. Winnipeg, Canada: J. J. Fedorowicz Publishing, 1996.
- Armstrong, Richard N., Colonel. *Red Army Tank Commanders: The Armored Guards.* Atglen, Pennsylvania: Schiffer Military/Aviation History, 1994.
- Babadjanyan, Amazasp, Marshal. "Tank and Mechanised Forces." In *The Battle of Kursk.* 2d ed. Translated by G. P. Ivanov-Mumjiev. Moscow: Progress Publishers, 1976.
- Badsey, Stephen, *Normandy 1944: Allied Landings and Breakout*, London: Osprey Publishing, 1990.
- Caidin, Martin. *The Tigers Are Burning: The Story of the Battle of Kursk - The Greatest Single Land and Air Combat Engagement in Military History.* New York: Hawthorn Books, Incorporated, 1974.
- Carius, Otto. *Tigers in the Mud.* Translated by Robert Edwards. Winnipeg, Canada: J. J. Fedorowicz Publishing, 1992.
- Coggins, Jack. *The Campaign for North Africa.* Garden City, New York: Doubleday & Company, Incorporated, 1980.
- Cross, Robin. *Citadel: The Battle of Kursk.* New York: Sarpedon, 1993.
- Duffy, Christopher. *Red Storm on the Reich: The Soviet March on Germany, 1945.* New York: De Capo Press, 1993.
- Deighton, Len. *Blitzkrieg: From the Rise of Hitler to the Fall of Dunkirk.* Edison, New Jersey: Castle Books, 2000.
- Dunn, Walter S. *Kursk: Hitler's Gamble, 1943.* London: Praeger Publishers, 1997.
- Fey, Will. *Armor Battles of the Waffen-SS, 1943-45* (Panzerkampf). Translated by Harry Henschler. Winnipeg, Canada: J. J. Fedorowicz Publishing, 1990.

- Fletcher, David. *Tiger! The Tiger Tank: A British View*. London: Her Majesty's Stationery Office, 1986.
- Glantz, David M. *From the Don to the Dnepr: Soviet Offensive Operations, December 1942 – August 1943*. Portland, Oregon: Frank Cass, 1991.
- Glantz, David M., and Jonathan M. House. *The Battle of Kursk*. Lawrence, Kansas: University of Kansas Press, 1999.
- Glantz, David M., and Harold S. Orenstein, eds. *The Battle for Kursk, The Soviet General Staff Study*. London: Frank Cass Publishers, 1999.
- Guderian, Heinz. *Achtung-Panzer! The Development of Armoured Forces, their Tactics and Operational Potential*. Translated by Christopher Duffy with an introduction by Paul Harris. London: Arms and Armour Press, 1995.
- _____. *Panzer Leader* (Erinnerungen eines Soldaten). Translated by Constantine Fitzgibbon with a foreword by B. H. Liddell Hart. New York: E. P. Dutton & Company, Incorporated, 1952.
- Gudgin, Peter. *Armoured Firepower: The Development of Tank Armament, 1939-1945*. Gloucestershire, England: Sutton Publishing Limited, 1997.
- _____. *The Tiger Tanks*. London: Arms and Armour Press, 1991.
- Habeck, Mary Ruth. *Imagining War: The Development of Armored Doctrine in Germany and the Soviet Union, 1919-1939*. Ann Arbor, Michigan: UMI, 1995.
- Hirlinger, Kurt, ed. *The Combat History of Schwere Panzer-Abteilung 508: In Action in Italy with the Tiger I*. Translated by David Johnston. Winnipeg, Canada: J. J. Fedorowicz Publishing, 2001.
- Jentz, Thomas L. *Germany's Tiger Tanks, Tiger I and II: Combat Tactics*. Atglen, Pennsylvania: Schiffer Publishing Limited, 1997.
- _____. *Panzertruppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1933-1942*. Atglen, Pennsylvania: Schiffer Publishing Limited, 1996.
- _____. *Panzertruppen: The Complete Guide to the Creation & Combat Employment of Germany's Tank Force, 1943-1945/Formation, Organizations, Tactics, Combat Reports, Unit Strengths, Statistics*. Atglen, Pennsylvania: Schiffer Publishing Limited, 1996.

- Jentz, Thomas L., and Hilary L. Doyle. *Germany's Tiger Tanks, D.W. to Tiger I: Design, Production and Modifications*. Atglen, Pennsylvania: Schiffer Publishing Limited, 2000.
- _____. *Germany's Tiger Tanks, VK45.02 to Tiger II: Design, Production and Modifications*. Atglen, Pennsylvania: Schiffer Publishing Limited, 2000.
- Jung, Hans-Joachim. *Panzer Soldiers for "God, Honor, Fatherland": The History of Panzerregiment "Grossdeutschland": The German Army's Elite Panzer Formation*. Translated by David Johnston. Winnipeg, Canada: J. J. Fedorowicz Publishing, 2000.
- Keegan, John. *The Second World War*. New York: Penguin Books Limited, 1990.
- Kleine, Egon, and Volkmar Kuhn. *Tiger: The History of a Legendary Weapon, 1942-45* (Tiger: Die Geschichte einer Legenden Waffe 1942-45). Translated by David Johnston. Winnipeg, Canada: J. J. Fedorowicz Publishing, 1989.
- Lochmann, Dr. Franz-Wilhelm, Dr. Nordewin von Diest-Koerber, Clemens Graf Kageneck, Ulrich Koppe, Richard Freiherr von Rosen, and Alfred Rubbel, eds. *The Combat History of Schwere Panzer-Abteilung 503, In Action in the East and West with the Tiger I and II*. Translated by Fred Steinhardt. Winnipeg, Canada: J. J. Fedorowicz Publishing, 2000.
- Macksey, Kenneth. *Tank Warfare: A History of Tanks in Battle*. New York: Stein and Day Publishers, 1972.
- _____. *The Tank Pioneers*. New York: Jane's Publishing, 1981.
- Mitcham Jr., Samuel W. *Crumbling Empire: The German Defeat in the East, 1944*. Westport, Connecticut: Praeger Publishers, 2001.
- Munch, Karlheinze. *The Combat History of Schwere Panzer-Jager-Abteilung 653, Formerly the Sturmgeschutz Abteilung 197, 1940-1943*. Translated by Bo H. Friesen. Winnipeg, Canada: J. J. Fedorowicz Publishing, 1997.
- _____. *The Combat History of Schwere Panzer-Jager-Abteilung 654, In Action in the East and West with the Ferdinand and the Jagdpanther..* Translated by Bo H. Friesen. Winnipeg, Canada: J. J. Fedorowicz Publishing, 2001.
- Nafziger, George F. *The German Order of Battle: Panzer and Artillery in World War II*. London: Greenhill Books, 1999.
- Nipe Jr., George M. *Decision in the Ukraine, Summer 1943: II. SS and III. Panzerkorps*. Winnipeg, Canada: J. J. Fedorowicz Publishing, 1996.

Ogorkiewicz, R. M. *Armored Forces: A History of Armoured Forces and Their Vehicles*. New York: Arco Publishing Company, Incorporated, 1970.

Perrett, Bryan. *A History of Blitzkrieg*. Introduction by General Sir John Hackett. New York: Jove Books, 1989.

Piekalkiewicz, Janusz. *Operation "Citadel": Kursk and Orel, the Greatest Tank Battle of the Second World War*. Translated by Michaela Nierhaus. Novato, California: Presido Press, 1987.

Restayn, Jean. *Tiger I on the Eastern Front*. Translated by Alan McKay. Paris: Histoire and Collections, 1999.

_____. *Tiger I on the Western Front*. Paris: Histoire and Collections, 2001.

Reynolds, Michael. *Men of Steel, I SS Panzer Corps: The Ardennes and Eastern Front, 1944-45*. New York: Sarpedon, 1999.

_____. *Steel Inferno: 1st SS Panzer Corps in Normandy*. New York: Dell Publishing, 1997.

Robinett, Paul McDonald, Brigadier General. *Armor Command: The Personal Story of a Commander of the 13th Armored Regiment, of CCB, 1st Armored Division, and of the Armored School during World War II*. Washington, D.C.: McGregor and Werner, Incorporated, 1958.

Rolf, David. *The Bloody Road to Tunis: Destruction of the Axis Forces in North Africa, November 1942 – May 1943*. With a Foreword by Major General Julian Thompson. London: Greenhill Books, 2001.

Rotmistrov, Pavel, Marshal. “Tanks Against Tanks.” In *Main Front: Soviet Leaders Look Back on World War II*. With a foreword by Marshal of the Soviet Union Sergey Sokolov and a commentary by Professor John Erickson. New York: Brassey’s Defense Publishers, 1987.

_____. “The Role of Armoured Forces in the Battle of Kursk.” In *The Battle of Kursk*. 2d ed. Translated by G. P. Ivanov-Mumjiev. Moscow: Progress Publishers, 1976.

Sadarana, Dana V. *Beyond Stalingrad: Manstein and the Operations of Army Group Don*. New York: Praeger Publishers, 1990.

Schneider, Russ. *Gotterdammerung 1945: Germany’s Last Stand in the East*. Philomont, Virginia: Eastern Front Warfield Books, 1998.

- Schneider, Wolfgang. *Tigers in Combat I*. 2d ed. Winnipeg, Canada: J. J. Fedorowicz Publishing, 2000.
- _____. *Tigers in Combat II*. Winnipeg, Canada: J. J. Fedorowicz Publishing, 1998.
- _____. *Panzertaktik: German Small-Unit Armor Tactics*. Winnipeg, Canada: J. J. Fedorowicz Publishing, 2001.
- Solovyov, Boris. *The Battle of Kursk: 1943*. Moscow: Novosti Press Agency Publishing House, 1988.
- Spaeter, Helmuth. *The History of the Panzerkorps Grossdeutschland*. Vol. 2. (Die Geschichte der Panzerkorps Grossdeutschland 2). Translated by David Johnston. Winnipeg, Canada: J. J. Fedorowicz Publishing, 1995.
- Steiger, Rudolf. *Armour Tactics in the Second World War: Panzer Army Campaigns of 1939-41 in German War Diaries*. New York: Berg Publishers Limited, 1991.
- Taylor, Daniel. *Villers-Bocage: Through the Lens of the German War Photographer*. London: Battle of Britain International Limited Church House, 1999.
- Tiemann, Ralf. *The Leibstandarte: Volume IV/2*. Translated by Frederick Steinhardt. Winnipeg, Canada: J. J. Fedorowicz Publishing, 1998.
- Vashurin, Pyotr, Lieutenant-General. “Tactics Employed by Ground Forces in the Battle of Kursk.” In *The Battle of Kursk*. 2d ed. Translated by G. P. Ivanov-Mumjiev. Moscow: Progress Publishers, 1976.
- von Mellenthin, F.W. *Panzer Battles: A Study of the Employment of Armor in the Second World War*. Translated by H. Betzler and edited by L.C.F. Turner. New York: Ballantine Books, 1956.
- Whiting, Charles. *Kasserine: First Blood*, New York: Stein and Day, 1984.
- Zaloga, Steven J. *Bagration 1944: The Destruction of Army Group Centre*. London: Osprey Publishing, 1996.
- Zaloga, Steven J., and James Grandsen. *Soviet Tanks and Combat Vehicles of World War Two*. London: Arms and Armour Press, 1984.
- Zetterling, Niklas, and Anders Frankson. *Kursk 1943: A Statistical Analysis*. London: Frank Cass Publishers, 2000.

Government Documents

Art of War Symposium, 1986. "From the Vistula to the Oder: Soviet Offensive Operations, October 1944 - March 1945." With a Foreword by Major General James E. Thompson and a preface by Colonel David M. Glantz. Washington, D.C.: Department of the Army, Center for Land Warfare U.S. Army War College, July 1986. Typewritten.

Breith, Hermann, General der Panzertruppen. *Breakthrough of a Panzer Corps through Deeply Echeloned Russian Defenses during the Battle of Kharkov (Kursk) in July 1943*. MS #D-258. Draft Translation. Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1947.

Buell, Thomas B., Clifton R. Franks, John A. Hixson, David R. Mets, Bruce R. Pirnie, and James F. Ransone, Jr. *The Second World War: Europe and the Mediterranean*, Volume I. West Point, New York: Department of History, United States Military Academy, 1979.

Daniel, K. R., Lieutenant Colonel. "Examination of Causes of Rendering Tanks Inoperative, dated 19 March 1945." In *Kasserine Pass Battles, Doctrines and Lessons Learned*: Volume II, Part 3. Washington, D.C.: Department of the Army, Center of Military History, 1995.

Glantz, David. *CSI Report No. 11: Soviet Defensive Tactics at Kursk, July 1943*. Combined Arms Research Library, Fort Leavenworth, Kansas; Fort Leavenworth, Kansas: Combat Studies Institute, U.S. Army Command and General Staff College, 1986. Text-fiche.

GMDS by a combined British, Canadian, and U.S. Staff. *The German Operation at Anzio: A Study of the German Operations at Anzio Beachhead from 22 JAN 44 to 31 MAY 44*. Camp Ritchie, Maryland: German Military Document Section, Military Intelligence Division, War Department, 1946.

Guderian, Heinz. "An Interview with Genobst Heinz Guderian." Interview by First Lieutenant Robert W. Fye. *Panzer Tactics in Normandy*. ETHINT 38. Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1948.

_____. "An Interview with Genobst Heinz Guderian." Interview by Major Kenneth W. Hechler. *Employment of Panzer Forces on the Western Front*. ETHINT 39. Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1945.

- Kesselring, Albert, Ernst K.H. Doll, Curt Gailenkamp, Kurt Maelzer, Max Simon, Kurt Wolff. *Manual for Command and Combat Employment of Smaller Units* MS #P-060b. Translated by G. Weber and W. Luetzkendorf and edited by G. C. Vanderstadt. Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1952.
- Moebius, Rolf. *German Heavy Armor*. MS #D-226. Draft Translation. Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1954.
- Mueller-Hillebrand, Herman Burkhardt, and Oskar Munzel. *Tactics of Individual Arms (Russian Armored Command, Examples from World War II, Part 1)*. With a Preface by Franz Halder. MS #P-060f. Translated by N. Franke and edited by L. Schafer. Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1951.
- Schmidt, Martin, Generalmajor. *Employment of Panzer Units in Central Italy in 1944, and Peculiarities Thereof*. MS #D-204. Translated by G. Kohler. Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1948.
- von Brauchitsch, Walther, Field Marshal. "Provisional Instructions for Leadership and Action of the Tank Regiment and Tank Battalion, dated 18 January 1941" British translation of captured German document. In *Kasserine Pass Battles, Doctrines and Lessons Learned: Volume II, Part 4*. Washington, D.C.: Department of the Army, Center of Military History, 1995.
- von Luettwitz, Heinrich. "An Interview with Gen Pz Heinrich von Luettwitz." Interview by Captain N. B. Sigband. *XLVII PZ Corps (24 Oct – 5 Dec 44)*. ETHINT 43. Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1945.
- von Manteuffel, Hasso, General der Panzertruppen. *Fast Mobile and Armored Troops*. MS #B-036. Translated by Mysing. Washington, D.C.: Department of the Army, Office of the Chief of Military History, 1945.
- Ziemke, Earl F. *Stalingrad to Berlin: The German Defeat in the East*. Washington, D.C.: Department of the Army, Center of Military History, 1987.

Video Recordings

- Carruthers, Bob. *Achtung Panzer! Steel Tigers: The Evolution of a Legend, 1939-1945*. Produced by Vanessa Tovell. 90 minutes. Cromwell Productions Limited, 1999. Videocassette.

Journals and Magazines

King, Curtis S. "Operation Bagration: A Soviet Victory." *Military Review*, April 1994, 89-93.

Margry, Karel. "The Four Battles for Kharkov." *After the Battle*, No. 112. 2001. 3-45.

Nipe, Jr., George M. "Kursk Reconsidered, Germany's Lost Victory?" *World War II*, February 1998, 26-32, 76.

Parker, Danny S. "German Tiger Tanks were at the Battle of the Bulge, but not in the numbers usually cited for them." *World War II*, March 1990, 8, 54, 56, 58, 60-61.

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